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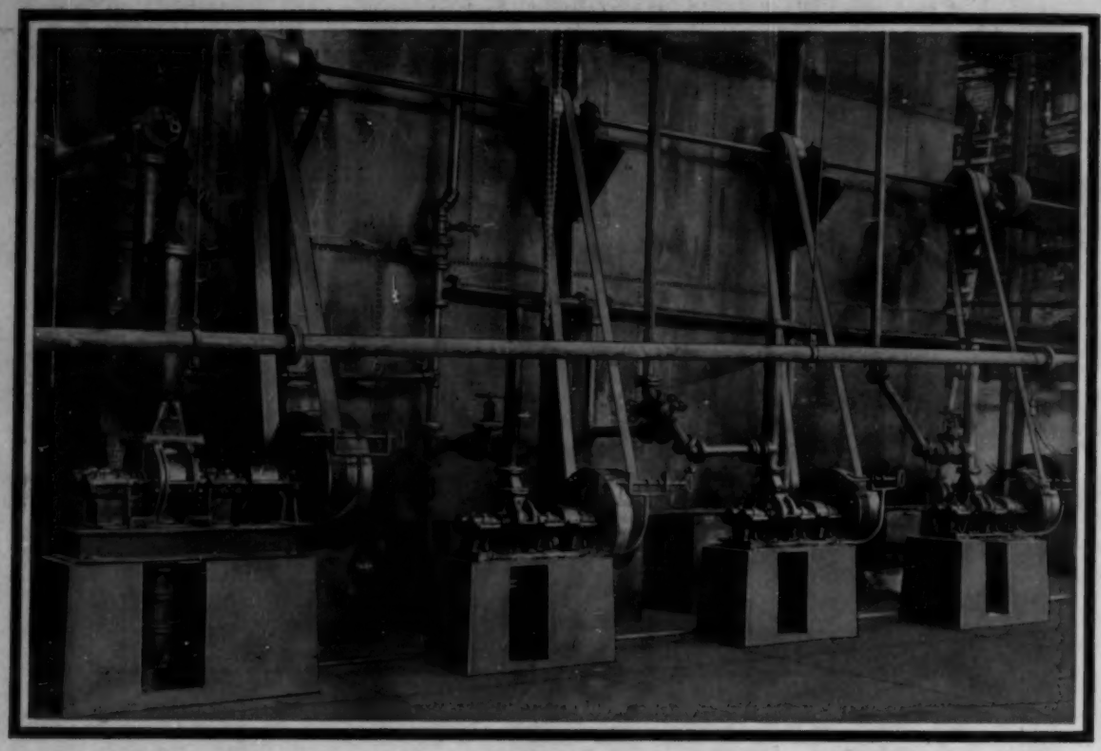
Engineering Directory, pages 240, 241, 242 Classified Advertisements, pages 253-277



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They are designed especially for that class of service and have extra heavy, liberal and well proportioned parts.

Can be furnished with Tight and Loose Pulleys and Belt Shifter, direct connected by coupling to steam engine, or gear connected to electric motor on extension of bedplate.

Important advantages are possessed over other types of pumps. Write us for particulars.

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THE IRON TRADE REVIEW

Vol. LXVI Cleveland, March 4, 1920 No. 10

Market Movements More Stable

Buyers and Sellers Continue to Display More Conservative Attitude and Prices Are Steadier—Prompt Material However Still Commands Fancy Prices—Railroad Buying Big Feature—Pig Iron Production Keeps Up Gain

SURVEYED generally, the iron and steel market appears to be better stabilized and prices to be under a greater measure of restraint. Here and there, indications are present that producers are more disposed to look up business than to await for it to seek them and in certain lines, some surprisingly quick deliveries occasionally are tendered. Despite a manifestly more conservative attitude among both buyer and seller however, the absorptive power of the market remains striking. The offer of material actually available for immediate shipment usually finds a ready buyer at exceptional prices. Sentiment is strong and the final decree by the Supreme Court in the dissolution proceedings against the Steel corporation is recognized as a further constructive factor. That the decision will exert any immediate bearing upon the present selling policy of the largest producer which has been the strict adherence to minimum prices, is considered unlikely.

A more cheerful outlook is presented over the transportation problem which has been severely harassing operations for some weeks. Though the actual betterment in the movement of cars and hence of raw and manufactured material has not been pronounced, the situation is beginning to unravel on virtually all sides and embargoes at many points either are being lifted or modified. Milder weather conditions are expected to expedite this improvement. The fuel situation has remained serious the past week especially in the Pittsburgh, Wheeling and Mahoning valley districts with some recurrence of plant suspensions.

High Prices Still Rule

Congestion of finishing departments by interrupted shipments has brought about considerable marketing of semifinished material by mills which ordinarily would have used this steel in their own operations. These sales especially of sheet bars have run to a round tonnage in the Pittsburgh district where a new top price of $90 for March delivery was paid this week, following previous transactions at $80 and $84. These prices for sheet bars accent the great strength of the sheet market. An automobile builder paid 9.00c, Pittsburgh, for a lot of 5000 tons of black sheets. There appears to be no limit to what consumers of this class will pay for material which will meet their requirements. A large independent company which has been selling plates, shapes and bars for second quarter at 4.00c, Pittsburgh, has booked considerable tonnage.

Production Is Increasing

February carried forward by a slight margin the rising line of pig iron production. The average daily output in that month was 102,547 tons compared with 97,172 tons in January and 84,711 tons in December. Owing to the shorter month however, the total output was slightly less, or 2,973,859 tons compared with 3,012,373 tons. The number of furnaces in operation at the end of February showed a net gain of 18 and totaled 303. This is the highest number since February, 1919, when 311 stacks were blowing.

Many inquiries for railroad equipment have been converted from a tentative to a definite basis during the past few days by the actual restitution of the roads to their former owners. At Chicago, inquiries for 30,000 freight cars now are in active negotiation calling for probably 350,000 tons of steel. The New York Central inquiry now amounts to 15,300 freight and 261 passenger cars in addition to 150 locomotives. Other new car inquiries include 3000 for the Grand Trunk and 1000 for the Erie. Recent car orders are reported to have totaled about 6000.

Iron Market Is Quiet

Well-established reports that some steel companies have basic iron for forward delivery to sell on the market have produced talk of lower prices on this grade at Pittsburgh. A Mahoning valley steel interest is preparing to offer the partial output of one furnace after June. Some sales of basic for early shipment actually have been closed at Pittsburgh at $41.50 valley. At the same time further lots of prompt basic have been sold during the week in northern Ohio at $43 furnace. On all sides the iron market continues quiet with new inquiry light and prices holding steady.

MARCH 4, 1920

THE IRON TRADE REVIEW

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Steel Industry Wins Victory

NINE years of exhaustive judicial examination of the form and practices of the United States Steel Corp. under the law reached their culmination Monday at Washington when the Supreme Court of the United States handed down its final decision in the action brought by the government to declare the corporation a combination in restraint of trade and therefore subject to dissolution. Though by a divided court, the result has been a complete victory for the Steel corporation. The finding of the lower courts that the largest industrial organization of the world by its organization and policies pursued has not violated the provisions of the Sherman antitrust act was sustained in all particulars.

The suit in effect has been a trial of the Steel corporation as to the exercise of its powers under present-day conditions, with due regard to the interests of the public at large. This viewpoint was set forth with much clarity and force by Justice McKenna in the majority opinion when he said:

"Our present purpose is not retrospect for itself, however instructive, but practical decision upon existing conditions that we may not by their disturbance produce, or even risk, consequences of a concern that cannot now be computed. In other words our consideration should be of not what the corporation had power to do or did, but what it has now power to do and is doing."

It is highly curious and interesting that at the very time the minority opinion of the Supreme Court makes the contention that the Steel corporation controls prices and production, the iron and steel market is giving very conclusive refutation of that point of view. Anyone who has followed the course of the iron and steel market for some weeks must be thoroughly impressed by that fact. As is well known, the Steel corporation has been quoting consistently the minimum level of prices recommended by the industrial board last March and has been exerting its moral influence against the elevation of quotations above that level. Yet under the operation of supply and demand, the market has ascended far above the Steel corporation prices and the latter have become practically a negligible factor.

From the viewpoint of co-ordinated business enterprise in this country, the Supreme Court decision is one of the most important ever rendered. It establishes finally and conclusively the doctrine that mere size is not inimicable to public welfare, or that potentiality for destructive practices constitutes a legal offense. It makes it certain that big business may be conducted on as equally high a moral plane as small and that the manifest advantages of the former may be preserved to the general public.

The successful defense by the Steel corporation under the laws of the land before the highest tribunal of the country, constitutes a supreme vindication of its well-established policies. As such it stands as a crowning achievement of Judge Gary's remarkable career as a business executive and statesman and of the wisdom of his leadership. Likewise it is a signal victory for the whole iron and steel industry of the United States which has accepted and followed that leadership of Judge Gary in many of its policies and practices. Lastly the rule of the court confirms the popular judgment that the Steel corporation is and has been a good trust. With that public faith now resting upon the highest legal verdict of the land, the Steel corporation may well be said to have established itself as a truly American institution.

Tin Market Is a Puzzle

PIG tin, always an erratic market performer, has broken all records by its weird movements of the past three months. The price of tin at London, where the quotations for the rest of the world are made, advanced steadily, with hardly a reaction, from Dec. 1 to Feb. 25. The amount of the advance was about £125, the price on Dec. 1 being £295 and on Feb. 25, £419. The reason for the rise has not been satisfactorily ex-

plained. American consumers have not been buying heavily. Stocks of tin in New York amounted to about 1500 tons as of Feb. 1 and the New York market has been the cheapest place in the world to buy tin. This has been due partly to the fact that in the recent contraction of bank loans on commodities, some holders of tin were forced to sell. However, since they had originally bought the tin much lower, no one suffered much loss. With the large stocks in New York and with large consumers, including most of the tin plate makers, covered well into the summer, consumers have sat back and watched the market jump day after day without much interest. It is true the American market has not reflected the advance abroad. This is due to the sharp decline in sterling exchange rates, which to a large extent has offset the advance in tin import costs. On Dec. 1 the rate for sterling checks was about $4. The current rate is something less than $3.40. Accordingly, the price of Straits tin in New York, which was about 54.50c per pound on Dec. 1, was only 65 cents when the London market reached its record level of £419, Feb. 25.

The normal price of Straits tin before the war was about 35 to 36 cents a pound. The wartime price was 72½ cents. Large consumers express little objection to paying 60 cents and they are not worried about future tin supplies. Thus they have no particular motive for purchasing so speculative a metal against future requirements at this time.

Withholding Tariff Legislation

DIFFERENCE of opinion exists among Republican members of the senate committee on finance with regard to the desirability of passing certain special tariff bills at the current session of congress, such as those relating to zinc, chrome, and tungsten ore and magnesite. A subcommittee had revised these measures, except the one concerning magnesite, after they had passed the house, and had laid them before the full committee. The latter, however, did not give its approval to any sort of tariff legislation at this time, except as to the dyestuffs industry. In consequence considerable bitterness has been expressed in debate on the floor of the senate by some of the Republican members because of the failure of the full committee to report out favorably the other bills, which, it appears, will not receive consideration before the next session of congress. Most of the democratic members of the committee have supported those Republicans who have opposed action on these special measures. This is the attitude assumed by Senator Penrose, chairman of the committee, who announced that nothing should be done with these "popgun" bills before the next session.

The chief reason why the enactment of such tariff legislation is favored is because there is no immediate likelihood under present conditions of the American market being supplied over-abundantly through importations with the products included in these bills.

More Workmen's Homes Needed

ONE of the large items of expense with which the employer must contend in proportion to his size is that of labor turnover. The annual loss entailed through the shifting of men from one plant to another runs into the millions. Furthermore it reduces production and often results in the lowering of the quality of output.

Investigation has shown that as a rule the steady employe is the man who owns or is buying his own home. He has more than his day's pay at stake. If he owns the house in which he lives he is settled and takes a natural pride in improving it. Consequently he is satisfied with his job and sticks to it. On the other hand, the man who is not the owner, or prospective owner of a home of his own, has nothing at stake other than his job, and he would as soon be employed in one place as in another. If employed in one city and he is informed that wages are a little higher in an adjoining district, the next pay day finds him moving on to the latter point of attraction. The first employer thereby is the loser. The man, probably having been employed for about six months, has been a liability rather than an asset on the firm's payroll for a considerable part of that time during which he was acquiring the rudiments of his job. Just when he is becoming proficient enough to be of real worth to the company he quits. The second company with which he obtains employment will suffer in the same way—unless the man becomes a home-owner.

Unfortunately there is a shortage of homes in every large manufacturing center of the country. In some places it is almost impossible to rent houses, and those available can be obtained only at comparatively high figures. This situation is the result of curtailed residential building during the war. But now that these restrictions have been removed, such building must go ahead at even a greater rate than it is, if the deferred supply is to be brought abreast of the demand.

In many instances, especially where large numbers are employed, it would pay companies to finance the construction of homes for their employes, and to then sell them on an easy payment or some similar plan. Many companies now are doing this, and beyond a reasonable doubt, although the investment is considerable, such undertakings will result indirectly in the saving of large sums to these employers.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 742 AND 746

Pig Iron

Bessemer, valley	42.00
Bessemer, Pittsburgh	43.40
Basic, valley	43.00
Basic, Pittsburgh	44.40
Basic, delivered, eastern Pa.	42.00 to 43.00
Malleable, valley	44.00
Malleable, Pittsburgh	45.40
Malleable, Chicago, furnace	43.50
Malleable, Buffalo, furnace	46.25
Malleable, delivered eastern Pa.	46.00 to 46.50

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern delivered Phila.	$46.60 to 47.10
No. 1X, Buffalo	48.00
No. 1 foundry, Chicago, furnace	45.25
No. 2 foundry, valley	42.00 to 43.00
No. 2 foundry, Pittsburgh	43.40 to 44.40
No. 2 foundry, Buffalo	45.00
No. 2 foundry, Buffalo, Boston	46.90 to 47.90
No. 2X, Buffalo, Boston	48.15 to 50.15
No. 2 foundry, Chicago furnace	43.00
No. 2 foundry, Ironton furnace	43.50 to 45.00
No. 2 foundry, Cleveland furnace	43.00 to 45.00
No. 2X, eastern, del., Phila.	45.35 to 46.10
No. 2X, eastern, N. J., tidewater	45.35 to 46.10
No. 2X, Pennsylvania, Boston	48.15 to 49.15
No. 2 foundry, Pennsylvania, Boston	46.90 to 47.90
No. 2X, foundry, Buffalo furnace	43.25 to 46.25
No. 2 foundry, del., Philadelphia	44.10 to 45.10
No. 2 foundry, N. J., tidewater	44.10 to 45.10
No. 2 southern, Birmingham	40.00 to 42.00
No. 2 southern, Cincinnati	41.60 to 43.60
No. 2 southern, Chicago	45.00
No. 2 southern, Phila.	43.50 to 44.50
No. 2 southern, Cleveland	45.00 to 47.00
No. 2 southern, Boston (on dock)	45.75 to 46.75
No. 2 southern, St. Louis	44.30 to 47.35
No. 2X, Virginia, furnace	43.25
No. 2X, Virginia, Philadelphia	47.35
No. 2X, Virginia, Jersey City	47.65
No. 2X, Virginia, Boston	47.95
Gray forge, valley, Pittsburgh	42.40
Gray forge, eastern Pa.	43.00
Silveries, 8%, furnace	53.00 to 55.00
Ohio Silveries, 8%, Chicago	56.30
Tennessee Silveries, 8%, Chicago	56.30
Low phos. standard, Phila.	53.80
Low phos. Lebanon, furnace	47.00
Low phos. stnd. valley del., Pitts.	49.40 to 50.40
Charcoal, Superior, base, Chicago	57.50

Coke

(At the ovens)

Connellsville furnace	$6.00
Connellsville foundry	7.00
Pocahontas furnace	8.00
Pocahontas foundry	8.00
New River foundry	8.00
New River furnace	8.00
Wise county furnace	7.25
Wise county foundry	8.25

Ferroalloys

Ferromanganese, 80 per cent, delivered, domestic metal	$160.00 to 225.00
Ferromanganese, 80 per cent, English c.i.f. Atlantic ports	155.000 to 165.00
Spiegel, 18 to 22 per cent furnace spot	57.00 to 60.00
Ferrosilicon, 50 per cent, spot and contract, delivered	80.00 to 85.00
Ferrotungsten, standard, per pound contained, furnace	90c to 1.10
Ferrochrome, 60 to 70 per cent chromium, 6 to 8 per cent carbon, per pound contained, maker's plant	19c to 20c
Ferrovanadium, 30 to 40 per cent per pound contained, according to analysis	$6.00 to 7.00
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 per cent	62.50 to 64.50
Bessemer, ferrosilicon, 11 per cent	65.80 to 67.80
Bessemer, ferrosilicon, 12 per cent	69.10 to 71.10

Prices at Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	65.00 to 70.00
Open-hearth, Youngstown	65.00 to 70.00
Open-hearth, Philadelphia	59.10 to 64.10
Bessemer, Pittsburgh	65.00 to 70.00
Bessemer, Youngstown	65.00 to 70.00
Forging, Pittsburgh	75.00 to 80.00
Forging, Philadelphia	74.10

SHEET BARS

Open-hearth, Pittsburgh	$70.00 to 80.00
Open-hearth, Youngstown	70.00 to 80.00
Bessemer, Pittsburgh	70.00 to 80.00
Bessemer, Youngstown	70.00 to 80.00

SLABS

Pittsburgh and Youngstown	65.00 to 70.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$52.00 to 70.00
Grooved skelp, Pittsburgh	3.25c to 4.00c
Sheared skelp, Pittsburgh	3.45c to 4.00c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	2.70c to 4.00c
Structural shapes, Philadelphia	2.70c to 4.15c
Structural shapes, New York	2.72c to 4.17c
Structural shapes, Chicago	2.72c to 2.97c
Tank plates, Pittsburgh	2.65c to 4.50c
Tank plates, Chicago	2.92c to 3.17c
Tank plates, Philadelphia	2.90c to 4.25c
Tank plates, New York	2.92c to 4.27c
Bars, soft steel, Pittsburgh	3.00c to 4.75c
Bars, soft steel, Chicago	2.62c to 2.87c
Bars, soft steel, New York	2.62c to 4.27c
Bars, soft steel, Philadelphia	2.60c to 4.25c
Bar iron, common, Phila.	3.75c to 4.00c
Bar iron, common Chicago	3.50c to 4.00c
Bar iron, common, Cleveland	3.75c
Bar iron, common, New York	3.77c to 4.02c
Bar iron, common, Pittsburgh	4.50c
Hard steel bars, Chicago	3.25c to 3.50c

Rails, Track Material

Standard bessemer rails, mill	$45.00 to 60.00
Standard open-hearth rails, mill	47.00 to 62.00
Relaying rails, light, St. Louis	45.00 to 50.00
Relaying rails, Pittsburgh	45.00 to 50.00
Angle bars, Pittsburgh base	3.00c to 4.00c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	3.00c to 3.50c
Spikes, railroad, Pittsburgh	3.85c to 4.00c
Track bolts, Pittsburgh	6.00c to 6.50c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c to 2.90c

Wire Products

(100 lbs. to jobbers, carloads; retailers, 5c more)

Wire nails, Pittsburgh	$3.25 to 4.00
Plain wire, Pittsburgh	3.00 to 3.50
Galvanized wire, Pittsburgh	3.70 to 4.20
Barbed wire, painted, Pittsburgh	3.40 to 3.90
Barbed wire, galvanized, Pitts.	4.10 to 4.60
Cut naails, Pittsburgh, l. c. l.	6.195
Coated nails per count keg, Pitts.	2.85 to 3.40
Polished staples, Pittsburgh	3.40 to 4.25
Galvanized staples, Pittsburgh	4.10c to 4.95c

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Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	6.25c
Sheet piling, base, Pittsburgh	2.55c to 3.65c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 8.00c to 9.00c.

Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 9.00c
No. 28, bessemer, Pitts.	4.35c to 9.00c
No. 28, open-hearth, Chi.	4.62c to 8.27c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c to 5.50c
No. 28, bessemer, Pitts.	4.35c to 5.50c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c to 9.65c
No. 28, bessemer, Pitts.	5.70c to 9.65c
No. 28, open-hearth, Chi.	5.97c to 8.92c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c to 7.50c
No. 10, bessemer, Pitts.	3.55c to 7.50c
No. 10, open-hearth, Chi.	3.82c to 6.77c
No. 10, open-hearth, Phila.	3.80c to 5.05c

Full sheet schedule page 746.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

Base, Pittsburgh	Black, Per cent off	Galv. Per cent off
¾ to 3 in., butt, steel	54 to 57½	40½ to 44
¾ to 3 in., butt, iron	34½	18½

Full pipe schedule page 746.

Boiler Tubes

Steel, 3½ to 4½ inches, c. l.	30½ to 40½
Iron, 3½ to 4½ inches, c. l.	11

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B

Four-inch, Chicago	$75.80
Six-inch and over, Chicago	72.80
Four-inch, New York	73.30
Six-inch and over, New York	70.30
Four-inch, Birmingham	69.00
Six-inch and over, Birmingham	66.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	4.50c to 5.00c
Bands, Pittsburgh	4.50c to 5.00c
Hot rolled strip steel, Pitts. stamping quality	5.00c to 5.50c
Cold finished steel bars, Pits., base	4.00c to 5.25c

Rivets

Structural rivets, Pittsburgh	4.50c
Boiler rivets, Pittsburgh	4.60c
Rivets ½ in. and smaller, Pitts.	50 off

Nuts and Bolts

(Prices f.o.b. Pittsburgh)

CARRIAGE BOLTS

(⅝ x 6 inches, smaller and shorter)

Rolled thread	40–5 off
Cut thread	30–10 off
Larger and longer	30 off

MACHINE BOLTS

(⅝ x 4 inches, hot pressed nuts)

Rolled thread	40–10–5 off
Cut thread	40–5 off
Larger and longer	30–10 off
Plow bolts Nos. 1, 2 and 3 heads	40 off
Other style heads	20% higher
Stove bolts in packages	70–10 off
Stove bolts in bulk	70–10–2½ off
Cold pressed semifinished hexagon nuts ¾ in. and larger	60–5 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	60–5 off
Gimlet and cone point lag screws	50 off

NUTS

Hot pressed, square blank	2.00c off
Hot pressed, square tapped	1.75c off
Hot pressed, hexagon blank	2.00c off
Hot pressed, hexagon tapped	1.75c off
Cold pressed, square tapped	1.75c off
Cold pressed, square blank	2.00c off
Cold pressed, hexagon blank	2.00c off
Cold pressed, hexagon tapped	1.75c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales, at the dates named

	Prices Mar. 3, 1920	Average prices Feb. 1920	Nov. 1919	Mar. 1919
Bessemer, valley, del., Pittsburgh	$43.40	$43.15	$32.00	$32.55
Basic, valley, delivered, Pittsburgh	44.40	43.65	30.40	30.35
*No. 2 Foundry, Val. del Pittsburgh	43.40	42.40	33.15	29.85
*No. 2 Foundry, Chicago, furnace	43.00	42.25	31.75	29.95
Lake Superior charcoal, Chicago	57.50	57.50	35.50	38.70
Malleable, valley	44.00	43.00	31.75	31.85
Malleable, Chicago	43.50	42.75	32.25	30.45
*Southern, No. 2, Birmingham	40.00	40.00	30.65	31.20
*Southern Ohio, No. 2, Ironton	43.75	43.00	31.75	29.95
Basic, eastern del., eastern Pa.	43.00	40.50	33.00	32.85
**No. 2X, Virginia, furnace	43.25	42.75	33.40	31.65
*No. 2X, eastern del., Philadelphia	45.35	45.00	35.85	35.16
Gray forge, valley del., Pittsburgh	42.40	41.40	31.80	29.60
Ferromanganese, 80 per cent, delivered	160.00	160.00	110.00	140.00
Bessemer billets, Pittsburgh	65.00	61.25	40.85	42.25
Bessemer sheet bars, Pittsburgh	70.00	65.00	45.00	45.75
Open-hearth sheet bars, Pittsburgh	70.00	65.00	45.00	45.75
Open-hearth billets, Pittsburgh	65.00	61.25	40.85	42.25
Steel bars, Pittsburgh	4.00	3.85	2.45	2.61
Steel bars, Chicago	2.62	2.62	2.62	2.81
Iron bars, Philadelphia	3.75	3.75	2.895	3.005

	Prices Mar. 3, 1920	Average prices Feb. 1920	Nov. 1919	Mar. 1919
Iron bars, Cleveland	$3.75	$3.75	$3.00	$3.15
Iron bars, Chicago mill	3.50	3.44	2.73	2.86
Beams, Chicago	2.72	2.72	3.07	2.89
Beams, Pittsburgh	3.25c	3.15	2.45	2.71
Beams, Philadelphia	3.75	3.75	2.695	2.958
Tank plates, Pittsburgh	3.75c	3.70	2.65	2.90
Tank plates, Chicago	2.92	2.92	2.92	3.15
Tank plates, Philadelphia	4.25	4.25	2.895	3.155
Sheets, blk., No. 28, Pittsburgh	6.00c	6.00	4.35	4.60
Sheets, blue anld., No. 10, Pittsburgh	5.50c	5.50	3.55	3.80
Sheets, galv., No. 28, Pittsburgh	7.25c	7.00	5.70	5.95
Wire nails, Pittsburgh	4.00	4.20	3.45	3.45
Connellsville furnace coke	6.00	6.00	5.85	4.00
Connellsville foundry coke	7.00	7.00	6.95	4.80
Heavy melting steel, Pittsburgh	28.00	28.35	21.85	14.60
Heavy melting steel, eastern Pa.	25.50	25.75	20.80	14.25
Heavy melting steel, Chicago	24.00	25.00	20.60	15.25
No. 1 wrought, eastern Pennsylvania	37.50	36.15	27.85	24.00
No. 1 wrought, Chicago	29.00	30.75	26.50	17.65
Rerolling rails, Chicago	32.50	34.60	31.10	16.30

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

Pig Iron Market in Quiet Stage

New Inquiries and Sales Continue of Light Proportions—Irregularity in Basic Reported at Pittsburgh With Steel Companies Preparing to Offer Metal — Further Sales Closed at $43 However—Southern Quotations Fluctuate

Chicago, March 2.—A comparative lull in pig iron buying seems to have followed the strong movement which has been in evidence for the past few weeks. It is not taken to mean that melters have covered for their last half requirements, as canvass here and there proves that many important users have not yet bought anything for last half and will require considerable iron. The opposite swing of the pendulum is expected to take up this slack a little later, and another movement almost equal to the first is looked for. The principal producer at Chicago has sold almost all its last half production and has comparatively little tonange left. Its quotation now is $43, furnace, for 1.75 to 2.25 silicon. Operating and fuel conditions continue bad and little hope of betterment is held. A conservative stand has been taken in estimating last half production for the purpose of limiting contracts and if fuel conditions become better as the year advances, somewhat larger tonnage may be made available. However, melters who have not bought up to this time probably will be forced to cover most of their requirements from other producing centers. The Illinois Steel Co., with one small stack at Milwaukee, has not yet sold any tonnage for last half and probably will apportion its iron on the basis of previous purchases without opening its books for general buying. No policy has been formulated yet as to prices or when the iron will be offered. Inquiry is decidedly lighter, falling off markedly from the past few weeks. A machinery manufacturer in Chicago has just closed for 3000 tons of malleable for last half, part from Chicago producers and part from an Ohio stack at $42.50, Ohio furnace, and $43.50, Chicago, respectively. Some sales of prompt iron in 200 and 400-ton lots have been made recently at $45, delivered Chicago, the iron coming from outside sources. Southern iron seems to be in rather an uncertain state, with at least two producers willing to take some tonnage for last half at $40, Birmingham. This is taken by some buyers as an evidence of weakness in the market. Another producer is accepting tonnage at $42, Birmingham, for last half delivery, although it announced a schedule of $43, Birmingham, originally. The latter appeared to be out of line. Low phosphorus iron is steady at $51, eastern furnace. Excellent demand is being made for silveries and some spot sales have been made by a Tennessee stack at $55, furnace, for 8 per cent. Furnaces in the Jackson county district proper are quoting the same figure, but are not producing.

Fuel conditions continue to hamper iron and steel production and are slow to improve. The Illinois Steel Co. now has three stacks banked and has three others ready to operate, after being relined. These are not put into service simply because fuel is lacking. Two other furnaces are being relined and one has been idle for more than a year and probably will not be made active for several months. Receipts of coal and coke have improved from time to time but the addition to the fuel stock has not been sufficient to make it possible to extend blast furnace activity.

Considerable Tonnage Is Sold

Philadelphia, March 2.—Good buying featured the pig iron market in the eastern Pennsylvania district the past week, involving mainly foundry at $43 and $44 eastern Pennsylvania furnace for No. 2 plain (1.75 to 2.25 silicon) and $44.25 to $45 for No. 2X (2.25 to 2.75 silicon). Virginia foundry iron continues to be offered at $42 base. Central Pennsylvania foundry iron now is offered less abundantly although the minimum price is unchanged at $42 furnace for No. 2. A large eastern Pennsylvania consumer who last week was negotiating for third quarter basic has decided not to buy at this time. It is understood $42, eastern Pennsylvania furnace, is the lowest price offered to this interest. Two other eastern consumers are negotiating for basic iron. No developments of note have appeared in low phosphorus. A round tonnage of gray forge iron was sold at $43 delivered eastern Pennsylvania. A lot of 1500 tons of bessemer iron was sold for export to Italy at $45 eastern Pennsylvania furnace. A round tonnage of malleable was sold at $45, Hanging Rock furnace in southern Ohio, for delivery to a Virginia destination. The silicon in Virginia foundry is running lower than expectations owing to the difficulties caused by severe weather.

Rise Seems to Have Been Rapid

Pittsburgh, March 2.—Outside of the fact that some evidence has appeared that the rise of basic pig iron to $43, valley furnace, is not so fully sustained, at least on sales in this territory, the past week has been a quiet and uninteresting one in pig iron. Some of the steel companies appear to have some surplus iron both for second quarter and last half shipment and where sales of such tonnages have been made, they have been well under the prices asked by merchant blast furnace interests. Sale of a sizable tonnage of basic is reported for March and April delivery at $41.50, valley furnace basis, and it is stated more iron is available at the same figure. At the same time one buyer in northern Ohio seeking 5000 tons for prompt delivery paid $43 furnace for this metal and part of it was valley iron. Reports current credited

the Pittsburgh Steel Co., the Donner Steel Co., the Republic Iron & Steel Co., the Alan Wood Iron & Steel Co. and the Eastern Steel Co. as having some surplus iron for open market disposal. The two latter companies recently started up new stacks and have some production available according to reports received here. News about the Bethlehem Steel Co. as a factor in the pig iron market is conflicting. One report is that this company recently offered 5000 tons of basic for second quarter shipment at $40, its furnace, which would mean $43.70 at Pittsburgh. Another report is that the company, because of the difficulties in securing enough coke to keep its furnaces in constant blast would not be able to ship against second quarter sales until the final quarter of this year. Merchant producers of pig iron as a rule are not inclined to pay much attention to the reported activities of the steel companies and the asking price of this grade with them still is $43, valley furnace. Liberal demand recently has been noted for bessemer and only small lots have changed hands, this usually at $42, valley furnace. Foundry interests are pressing for deliveries against contracts and occasionally are making small lot purchases to piece out when producers are unable to make shipments. Such business as has lately been done of this grade has been at from $42 to $43, valley furnace. Low phosphorus pig iron has not yet done more than $48, valley furnace in this market. Silveries are in good demand and both the Bessie Furnace Co., New Straitsville, O., and the Sharpsville Furnace Co., Sharpsville, Pa., recently announced an increase of $3 per ton to a base of $53, furnace, for 8 per cent. Blast furnace operations in this district have been affected by the scarcity of coke to the extent that a number of stacks have been running on checked blast while occasionally, banking has been necessary. The Carnegie Steel Co. now has 51 of its 59 furnaces in blast; 53 furnaces are rated as 100 per cent operations by this company, which usually has six of its stacks down.

Basic Sold at $43

Cleveland, March 2.—New business has quieted down considerably in the local pig iron market. Sales of the past week have been light and new inquiry has been proportionate. Most of the more important buyers now seem to be comfortably covered on their forward requirements. Current demand, however, is as strong as ever and buyers and melters are pressing the furnaces closely for shipments. Traffic condition have been somewhat better the past week with the appearance of more open weather and the movement of the iron from the furnaces has been heavier. Despite some reports to the contrary basic for early shipment continues to be firmly pegged at $43 furnace. A northern Ohio buyer who came into the market unexpectedly this week paid this price for about 5000 tons for shipment over the next 30 days. This was the lowest price that could be obtained and there were not many lots offering at this or any figure. Some of this iron will come from valley furnaces. One middleman quoted $45.50 furnace on a tonnage for 30 days shipment. Another northern Ohio steelmaker will be in the market soon for second quarter requirements which are not yet safely covered. These are estimated at about 5000 tons monthly. Foundry iron continues to be quoted by several interests at $42 and $43 furnace for 1.75 to 2.25 silicon, depending upon individual circumstances. One interest reports sales during the week of about 7000 tons on this basis. Local makers now are quoting $43 for last half but such small quantity as they have for early shipment is held at $45 furnace. The second stack of the Cleveland Furnace Co. was blown in this week. The United Furnace at Canton has been banked for a few days because of foundation trouble but is resuming this week.

Still Short of Iron

Boston, March 1.—Continued embargoes on all shipments of pig iron entering New England are forcing a serious situation upon the foundries, many of which are at present on the verge of closing down. Resale spot iron from one point to another in New England is in great demand and several sales at approximately $60, delivered, for No. 2X (2.25 to 2.75 silicon) have been reported. Offerings from the furnaces are meager, and most of the sales made have been for the last half. One sale of 500 tons of No. 2X (2.25 to 2.75 silicon) was made by a Buffalo furnace to a machine tool manufacturer in central Massachusetts at $46.25, furnace, or $50.15, delivered. Several furnaces in Pennsylvania have been offering limited amounts for last half, and a number of small sales have been made at a base price of $45, furnace. A Massachusetts jobbing foundry bought 500 tons of eastern Pennsylvania iron for last half at $46.25, furnace, or $49.15, delivered, for No. 2X. A machinery manufacturer bought 1000 tons and a textile interest also bought 1000 tons, both for last half delivery. One Virginia furnace is still in the market for the last half with iron on a basis of $42, and sales aggregating several thousand tons have been made in Boston during the past week. The tieup on the railroads has brought southern iron for rail and water shipment into greater demand, and many small orders have been placed. However, no shipments have reached Boston, and there are rumors of the closing of the Cape Cod canal. Several concerns have expressed their willingness to place orders for moderate tonnages, but the question of price is more carefully considered than it was a week or two ago. A Connecticut interest is in the market for a fair tonnage of malleable iron for last half. An eastern Massachusetts foundry wants 500 tons of No. 2X, and a central Connecticut foundry is in the market for 1000 tons. The total tonnage sold in Boston during the past week was probably under 10,000.

Predicts Higher Prices

New York, March 1.—Demand for pig iron in this district improved during the past week, following the lull during most of February. While sales were not as big as during the record weeks in January, some sellers report that they sold more tonnage in the past week than in any other week in February. Most of the iron bought was for spot or nearby delivery. Some of it was bought because of the fact that deliveries are overdue on contracts in some cases. In several cases, however, large consumers find that their requirements are in excess of their expectations, and buying originating in such needs accounted for most of the tonnage taken during the past week. Demand for second half is of limited proportions. Prices are unchanged from a week ago and the market may be quoted at $43, eastern Pennsylvania furnace, for 1.75 to 2.25 silicon, and $44.25 for 2.25 to 2.75 silicon, and the bulk of the tonnage now being sold is going at this level. At the same time, higher prices are being done. On central Pennsylvania iron, the market minimum continues $42, furnace, for 1.25 to 2.25 silicon, with higher prices being done in some instances. Fair tonnages of Virginia iron have been sold during the past week on the basis of $42, furnace, for deliveries both in first and second half. In one case, some Virginia iron has been sold for shipment to the West on the basis of $44, on 1.75 to 2.25 silicon. A Virginia maker which has been selling for some time for first half delivery, now is out of the market except for a limited tonnage of high silicon, and there at present is only one really free seller of Virginia iron. It is learned that considerable gray forge iron is being disposed of in eastern Pennsylvania in exchange for mill cinder and scale.

It is of interest to note that a well-known authority on the pig iron market has made a prediction that prices on pig iron are going considerably higher than they now are. He predicts continued shortage of pig iron over the next 12 months, and says that during that period very interesting prices will be paid. In this connection, it is of interest to note that buyers in most cases now are not nearly so much concerned over the price they have to pay as over whether they are going to get the iron. For instance, one buyer placed an order for a round tonnage of 2.75 to 3.25 silicon during the past week for quick shipment without even inquiring as to the price. A large railway equipment interest has paid $60, Ohio furnace, for a round lot of 3.50 to 4 per cent silicon foundry, low in manganese and phosphorus, for prompt shipment. Another interest has paid $50, eastern Pennsylvania furnace, for a round lot of 3.50 to 4 per cent silicon, standard foundry iron for spot shipment. Some consumers of late have been seeking to buy iron for forward delivery at prices prevailing at the time of shipment. While some furnaces are unwilling to accept orders on this basis, others are taking them, feeling there is every likelihood that by such an arrangement they will obtain higher prices than if they were to sell ahead at today's market.

Republic to Sell Basic

Youngstown, March 2.—Preparations now are being made by the Republic Iron & Steel Co. to change its Atlantic furnace at New Castle, Pa., from bessemer to basic iron and

to sell the product in the open market. From present estimates the change will become effective about June 1. A double strand pig machine now is being installed to handle the basic melt. The furnace is rated at 350 tons per day.

Continues Selling at Buffalo

Buffalo, March 2.—Probably 8000 tons of foundry iron was sold in this district during the past week, despite the fact that furnaces ostensibly are out of the market for the balance of the year. The iron was sold to accommodate old customers. One furnace sold something less than 4000 tons of foundry iron at a base price of $45 for No. 2 foundry (1.75 to 2.25 silicon); $46.25 for No. 2X (2.25 to 2.75 silicon), and $48 for No. 1X (2.75 to 3.25 silicon). This furnace also sold some malleable iron at $46.25. Another furnace took 3000 tons of foundry at $45, base, for third and fourth quarter delivery. A third furnace interest took less than 1000 tons of foundry iron at $45. All interests complain of a shortage of cars, which is compelling at least two furnaces to pile iron. One interest is about 20,000 tons behind in shipment, while consumers are pleading for material. Embargoes on shipments to points in New England are creating some confusion. In the last two days an improvement was noted in the car supplies. Furnaces are confining shipments to current orders. An inquiry for 10,000 tons of basic iron from the Canadian Steel Foundries of Hamilton, Ont., is still before the market. The last basic sold here was at $44. Large consumers of all grades of iron now seem to be well covered.

St. Louis Market Slows Down

St. Louis, Feb. 28.—Pig iron melters in this territory have covered on their immediate requirements and inquiries are not so brisk. Furnaces which a few weeks ago had nothing to sell now are beginning to accumulate iron. This is accounted for in a large measure by the car shortage. Several agencies here had tonnages consigned to them in the past week which they have had some difficulty to dispose of. Another evidence of a greater supply of iron are requests to hold down shipment on contracts temporarily. Up to this time every melter in the district was eager to get his raw material in his yard, regardless of whether he had immediate use for it. Prices range from $40 to $43 for No. 2 Southern (1.75 to 2.25 silicon). According to one interest, anything above a Birmingham base of $40 is a fictitious value.

Furnace Companies Not Selling

Birmingham, Ala., March 2.—Few inquiries are being received for pig iron, and furnace companies apparently are not anxious to sell. Three or four producers are practically out of the market. All attention is being directed to production and delivery, and the obstacles to be overcome. The railroad car shortage is felt not only in getting in raw material, but also in shipping iron. Illness also is prevalent among the workmen. Quotations are unsettled, ranging between $40 and $42 for No. 2 foundry (1.75 to 2.25 silicon). Inquiries are still being received for last half iron but no selling is reported here.

Paying More For Coke

Steel Companies Buying at Producers' Figures, While Furnace Interests Oppose More Than Government Price—Sales at $10 to $12

Pittsburgh, March 2.—Spot tonnages of beehive oven coke still are unobtainable at the government prices, although consumers willing to pay $10 or $12, ovens, have not lacked opportunity to purchase from some of the smaller producers. No particular distinction is made btween 48-hour and 72-hour coke, either as to price or ultimate use. Foundries cannot use to the best advantage coke burned only 48-hours, but then little of the "free" supplies of coke have been in the ovens less than 72 hours. The car supply makes necessary less frequent drawings of the ovens, and blast furnaces can use 72-hour coke, although with less satisfactory results than that burned for the shorter period. While there is a pronounced aversion on the part of merchant blast furnace interests to making purchases at prices above the government maximums, steel companies are showing more interest in the prices asked by some of the operators. In some instances, the prices asked by these operators are being paid without dispute, but it is probable that in such cases the steel companies placed blanket contracts, agreeing to take for an indefinite period the output of the ovens they were buying from prior to Dec. 6. Another way employed in getting in excess of the government prices is for the steel company to allow the coke producer to buy a tonnage of pig iron at a price sufficiently below the market quotation to net a substantial profit on the sale of the iron. Larger coke producers are paying some attention to the fuel administration regulations, but this involves no sacrifice since they are shipping the bulk of production on contracts, most of which call for more than the fixed prices. Coke car allotments in the Connellsville regions again were light last week.

The car outlook for this week is poor. Yesterday, the district had a 50 per cent allotment, while today's spottings were only 30 per cent. Disapointment among coke producers over delay in lifting government restrictions is tempered by the belief that the fresh lease of life of the fuel administration is chiefly or the purpose of controlling distribution of coal or bunkering, export, and shipment to New England. Connellsville production of coke for the week ended Feb. 21, is estimated by *The Connellsville Courier* to have been 235,157 tons, against 243,986 tons in the previous week.

Opens Books for Last Half

Boston, March 1.—New England by-product producers opened their books in the past week for coke for last half delivery. An unusually large tonnage of business was booked. Both the Providence Gas Co., and the New England Coal & Coke Co. are quoting $13.50 per ton, delivered to nearby points in New England. The Providence, R. I., price covers all New England points and the Everett, Mass., price covers points within a $2.40 freight rate from the ovens and also provides for a price of $11.55, ovens, for delivery to more distant points. Foundries have been anxious to cover for their last half coke because they have already sold their output for that period. The total tonnage sold during the week probably reached 100,000 for New England delivery. The Everett producer is still offering spot coke at a flat delivered price of $14.95 to points within the $2.40 freight rate. Spot coke from this interest is also being offered in New York and New Jersey on a basis of $12.55, ovens, but the supply for such shipment has been nearly exhausted.

Still Sell New England Coke

New York, March 1.—New England continues practically the only source of foundry coke for spot shipment, so that consumers in this district continue to buy considerable by-product tonnage from the New England Coal & Coke Co. A large tonnage has been booked by this interest during the past week at its present price of $12.55 ovens, or $15.85 delivered at Newark, for spot and nearby shipment. This producer has sold foundry coke during the past week or two for shipment to points as far west as Ohio. Both of the New England by-product coke producers are selling foundry coke freely on the basis of $13.95 delivered in New England, for second half.

Sell at $14.40 Delivered

Cleveland, March 2.—Sales of a few carloads of New England by-product foundry coke in this territory recently were made on the basis of $14.40 delivery or $10 ovens. The price of this eastern producer now is $12.55 ovens.

Coke Scarcer at St. Louis

St. Louis, Feb. 28.—Coke is growing scarcer in this district and in the west. Deliveries have not improved, nor are there prospects of increased offerings at ovens. Most of the producers supplying this district are apparently well sold up, and are not expected to be in the market for some time. Smelters in the Southwest are preparing to curtail operations or suspend unless they are able to obtain coke.

Demand Continues Strong

Birmingham, Ala., March 2.—Demand for coke in the South continues strong. Production is lagging, as the coal output continues to fall off as a result of the railroad car shortage and illness among mine workers. Morris Bush, president of the Birmingham Coke & By-Products Co., reports contracts in hand for the entire output of coke and by-products of the new 50-oven plant at Boyles, near Birmingham. Inquiries are in hand from the west and other sections for a large quantity of coke.

Bar Supplies No Easier

More Business Being Declined Than Accepted—Prices Continue to Show Wide Spread—Pittsburgh Again Advances Bar Iron

Chicago, March 2.—Producers of soft steel bars in the Chicago district are not now in the market, the leading interest and the leading independent both being sold out for first half and not being ready to take on business now for last half. While the leading interest maintains its prices unchanged and apparently will not recede from its position on this schedule, other producers believe they must charge more when selling is resumed and are groping about to determine what would be a fair level. It has been suggested that the government schedule in effect at the time of the armistice would be eminently fair to all and view of recent increase in production cost would give only a fair profit. This is $11 higher than the March 21 schedule which is in effect now on the part of the leading producer. Some sales of steel bars by eastern interests have been made at prices reported to be 4.00c, Pittsburgh.

Mills producing hard steel bars rerolled from rails are practically filled to July 1, but are able to take small tonnages from regular customers. The quotation at present is 3.50c, mill, and shipments on no-price contracts are being made at the same figure.

Excellent inquiry is being received for bar iron with deliveries ranging from one to three months. Mills are well filled and are quoting 3.50c, Chicago mill, on bars, and 4.00c, Chicago mill, on bands ¼-inch and lighter.

Jobbers Buy at 4.00c

Philadelphia, March 2.—One eastern interest which is booking bars for second quarter at 4.00c Pittsburgh, says all of its jobbers have accepted the opportunity to close. Otherwise very little steel bar business was done the past week and prices on this varied all way from 2.35c to 3.50c Pittsburgh. Spring steel is bringing 4.50c Pittsburgh, and cold-rolled steel 5.25c to 5.50c Pittsburgh. Iron bars generally are held from 3.75c to 4.00c Pittsburgh, although 3.50c still is being done. Some bolt and nutmakers still are taking business at prices established last August but they are taking it only from their regular customers and only to extent of their ability.

No Easing in Supply Situation

Pittsburgh, March 2.—The supply situation in merchant steel bars still is extremely tight due to the fact that the production of steel has suffered considerably in the past week or 10 days because of the fuel and car situation. It is no exaggeration to say that considerably more business in bars is being declined than accepted. The leading interest has practically withdrawn from the market on tonnages calling for shipment over the remainder of this year and the position of the independent companies is not much easier. On prompt shipment business 4.00c, base, appears to be the minimum at present, while some makers who can take on additional orders only through fresh purchases of billets are inclined to place the price of bars at the current market for billets. These makers are getting as high as 4.50c to 4.75c for soft steel bars. Forging bars for early delivery are not available much below 4.25c, base. No big tonnages of concrete reinforcing bars recently have been sought but there is a steady flow of small lot tonnages to makers in this district. Prices of these bars range within the same limits as those for soft steel bars. Another advance of $5 per ton has been announced by leading makers of iron bars, putting a Pittsburgh rate of common iron bars on a basis of 4.50c.

Won't Take Full Order

Cleveland, March 2.—Reinforcing bar makers are unable or unwilling to offer any large tonnages at the present time as has been shown by the recent negotiations for 10,000 tons for last half conducted by a local manufacturer of concrete forms. No producer quoted for the full tonnage though several entered prices for a portion of the lot. Some mills quoted 4.00c on the order and it is understood the buyer placed a small lot around that figure. The general bar demand continues heavy. The shipping situation shows some improvement.

Shafting Base Up to 5.25c

Pittsburgh, March 2.—No material letdown is noted in the demand for prompt tonnages of cold-finished steel bars, particularly in rounds, squares and hexagons in sizes from 1½ inches down, and for screw stock. The latter is so hard to obtain in bars that some makers lately have been using soft, free-cutting bessemer rods, for which they have paid up to $80 per ton. Cold-drawn, this material has sold up to 6.50c, base. The larger makers of cold finished bars are sold up for several months and out of the market for the present on new business. Current demands are thrown upon two or three makers and the prices quoted by these interests conform to the prompt market on billets and hot-rolled bars. Little basis in prompt tonnage business exists for a price below 4.50c, while as much as 5.00c, base, is being obtained. One maker of a special line of shafting recently announced an increase in his base price of 5.25c, Pittsburgh.

New Card at Chicago

Chicago, March 2.—Western manufacturers of bolts and nuts have adopted the new price put out 10 days ago in the east. This is an advance of about 10 per cent. Inquiry is strong and inasmuch as sales made now for specifications during second quarter will cover deliveries over third quarter, the advance is to cover the probably greater cost of production at that time.

Prices Still Tending Higher

Pittsburgh, March 2.—Prices of nuts, bolts and rivets still are headed toward higher levels chiefly because makers are having so much difficulty in obtaining raw materials on contracts and are being forced to purchase prompt tonnages of rods and bars at high prices in an endeavor to meet their obligations. Naturally this is reflected in the price of the finished product. Some makers of track bolts now are quoting as high as 6.50c base in car loads while all sizes of cold-pressed semifinished nuts are taking a discount of 60 and 5 per cent. A further cut in the discount of hot and cold pressed nuts is noted, blanks now being quoted at 2.00c off and tapped 1.75c off list. Makers have sold well into the third quarter and are declining more business than they are booking.

Car Inquiries Are Many

Chicago, March 2.—Inquiry for railroad freight cars is beginning to come out heavily with the return of railroads to their owners and approximately 30,000 cars have been inquired for in this district, which will require roughly 350,000 tons of steel. This is in addition to something like 25,000 tons of steel required for repair shops just placed with builders. The car inquiry includes 15,300 cars for the New York Central, made up as follows: 4800 hoppers, 5600 box, 1100 gondolas, 1700 flats, 1800 stock, 250 refrigerator and 50 ballast cars. This road also desires 261 passenger cars. The Rock Island railroad is inquirying for 3250 cars, including 250 flats, 500 stock, 2000 box and 500 general service cars. The Grand Trunk railroad is inquiring for 3000 box cars, the Illinois Central railroad 1000 gondolas, the Erie railroad 1000 hoppers, the Union Pacific railroad 45 caboose cars and 65 passenger cars and the Roger Ballast Car Co. for 500 ballast cars, 200 of this number having been let to the American Car & Foundry Co.

The Tennessee Coal, Iron & Railroad Co. has bought 30 coke cars of 50-ton capacity from the Pressed Steel Car Co.

Although the western rail mill has sold its capacity production for the remainder of the year, it is still receiving inquiry in lots of 500 to 5000 tons, which it is not able to take.

Orders Still to Appear

Pittsburgh, March 2.—Although a report has been common that the railroads of the country were converting reservations for rails and other track materials, made some time ago, into actual contracts, such reports find no verification here as far as rails are concerned. The Carnegie Steel Co. and the Cambria Steel Co. have completed the commandeered tonnages for the railroad administration but these companies

are busy in the rail mills because of the existence of a substantial amount of business placed prior to the railroad administration orders. The Steel corporatoin mills still are holding to the old March 21 basis on rails but neither the Midvale Steel & Ordnance Co. nor the Bethlehem Steel Co. today would take business except at a substantial advance over those figures.

Demand for light rails continues good with independent makers reporting more difficulties in obtaining 3.00c base. Production of spikes, both standard and small, is sold up over the next few months and makers are not much interested at even higher price than recently prevailed.

More Work Appearing

Cleveland, March 2.—Railroad work is appearing in the market more noticeably, but the volume still is light. The Cleveland Railway Co. has closed with the Carnegie Steel Co. for 12,000 steel ties. The Nickel Plate is inquiring for 1200 tons additional.

Plate Demand Now Heavy

Numerous Equipment Orders Call for Large Aggregate of Steel — Round Lots for Car Repairs Placed by Railroads in East

Philadelphia, March 2.—That plate buyers are covered ahead only on actual requirements, and that tonnage on books is not the result of anticipating requirements, is pointed out by one eastern platemaker. He says: "On account of the attitude of steel manufacturers recently, buyers now are confining themselves to being covered for actual business which they are taking, so that the tonnage on the books represents actual business and not more tonnage than the buyers are able to use. This is further proved by the fact that a large number of our customers who contracted for first quarter are now after more tonnages for specific jobs which are in excess of their contracts."

Large railroad buying has featured the eastern plate market. This buying was done at prices ranging from 2.65c to 4.00c, Pittsburgh, considerable being at the latter figure. The Pennsylvania railroad bought 7500 tons of plates, 1500 tons of shapes and 500 tons of bars. The Baltimore & Ohio railroad bought 5500 tons of plates, the Western Maryland 1500 tons and the Reading 1000 tons. All these plates are for car repairs. Huge tonnages of plates are involved in car inquiries put out by the railroads. Plates are also being ordered for new locomotives for American roads. Orders continue to come in from all other sources, but this inquiry is not so large as it was recently. While most mills have not yet opened books for the second quarter, one maker which is booking at 4.00c, Pittsburgh, says all of its jobbers have accepted the opportunity to cover at this price for the second quarter. An Italian house wants 4500 to 5000 tons of ship plates and is willing to pay 4.50c, Pittsburgh. The best deliveries obtainable in the East are six to eight weeks on universal, and three months on sheared. The Pottstown Iron Co. has let a contract for rebuilding its universal plate mill at Pottstown, which was destroyed by fire Jan. 2.

Prices Not Well Defined

Pittsburgh, March 2.—While the demand for early tonnages of plates remains active and insistent, especially on the part of the fabricating interests and builders of tanks, the actual amount of business being closed is comparatively small due to the unwillingness of manufacturers to add further to their obligations. Prices under these circumstances are taking a wide range with no two makers quoting the same base. The Carnegie Steel Co. is out of the market on new business for the present and its commitments will engage capacity for several months and it apparently does not further want to be tied up. For a time this company has entered orders calling for no specific shipping date but now even such business is being declined. This company's quotation remains unchanged at the March 21 base of 2.65c. Independent companies occasionally are entering orders from their regular customers as low as 3.00c and this constitutes the present minimum price, while other quotations run as high as 4.50c and even 8.00c. On the bulk of prompt shipment tonnage in plates the market is quotable at 3.50c to 4.00c.

Cars Demand Plates

Chicago, March 2.—The only activity in the plate market under present conditions arises from inquiry for railroad cars, as this is practically the only selling that mills will do beyond what they have already done. The present inquiry in hand involves about 350,000 tons of steel, of which more than one-third is steel plates. This tonnage, added to the heavy burden already on plate mill books, means capacity operation well beyond mid-year.

Sell Second Half Ferro

New York, March 1.—Considerable English ferromanganese has been sold during the past week for second half shipment at $155, c.i.f. tidewater. One seller, after disposing of 2000 tons at this figure now is out of the market. Another importer has sold considerable tonnage at $155 and is not certain whether or not it has any more to sell at this figure. All other importers now are out of the market, excepting insofar as they might be able to have individual tonnages accepted on submitting them by cable. Incidentally, no more English ferromanganese has been sold at the $165, c.i.f. tidewater price, at which 200 tons recently were sold. Domestic ferromanganese continues obtainable for second half delivery at $160, delivered. Carloads of spot ferromanganese have been sold during the past week at $200, delivered.

An inquiry for 2000 tons spiegeleisen now is before the trade. One large producer of spiegeleisen now is out of the market for the present. On the basis of business which was done recently, the spiegeleisen market continues to be quoted at $57 to $60, furnace, for 20 per cent metal, but it is not certain that any tonnage now could be had at less than $60.

Leading makers of 50 per cent ferrosilicon have advanced their quotation for this grade to $85, delivered. Sales of carloads for early shipment are reported at this figure. Some sellers continue out of the market. One maker is quoting $120. Whereas some sales of 75 to 85 per cent ferrosilicon recently were reported at a shade below $140, delivered, large makers now have advanced their price to $145.

Foreign ferrochrome, containing 6 to 8 per cent carbon, is offered at 17 to 18 cents a pound contained according to quantity for spot delivery. Several hundred tons of this material are in New York warehouse. Domestic makers continue to quote 19 to 20 cents a pound on contract.

Foreign ferrotungsten is offered for immediate shipment from stock at slightly less than 85 cents a pound contained. Domestic makers, however, report some business at $1 a pound contained, which is the established domestic price. English makers are circularizing the trade with offers of ferrotungsten for shipment as low as 55 cents a pound.

High grade ferrovanadium remains scarce and in good demand. Quotations on ferrovanadium range from $6.25 for high silicon material, to $7 and higher on low silicon alloy.

The market for ferromolybdenum is rather quiet, with producers quoting $2.25 to $2.35 a pound contained.

Spot Ferromanganese Scarce

Pittsburgh, March 2.—Spot tonnages of ferromanganese still are so small that almost no business is being done and prices are indefinite. It is believed that if any material were available it could be moved without much trouble at $200, while one dealer reports having obtained $225 for small lots from warehouse. Third and fourth quarter domestic material has been sold recently at $155 and $160, delivered, while English material has sold at $150, c.i.f. Atlantic seaboard.

Attempts on the part of producers of 50 per cent ferrosilicon to obtain higher prices have not been successful. Con-

Prompt Ferro at $200

Chicago, March 2.—Ferromanganese continues scarce with contract tonnages unobtainable except for late last half delivery, the quotation being $160, furnace. Some resale material for prompt delivery has been unearthed here and there at $200, owners taking the profit on their excess tonnage and buying at the lower figure for later delivery.

Steel Scrap Active in East

Sizable Lots of Heavy Melting Steel Sold at $29 Pittsburgh—Better Tone at Chicago—Uncertain Elsewhere

FOR COMPLETE SCRAP PRICES SEE PAGE 742

Philadelphia, March 2.—The Jones & Laughlin Steel Co., Pittsburgh, is said to have bought 15,000 to 20,000 tons of heavy melting steel at $29 delivered Pittsburgh and one eastern dealer has sold 1000 tons of steel at $29 delivered Pittsburgh. In the east there has been more activity and there is strong tone. The John A. Roebling Sons' Co. bought 5000 to 8000 tons of steel at $27 delivered. The crucible Steel Co. 5000 tons at $26.50 delivered Newark, and the Worth Steel Co. several thousand tons of steel at $25.50 delivered and now is offering $25 delivered. The Midvale Steel & Ordnance Co. is offering to pay $25 delivered Coatesville. A better demand is current from the rolling mills. Four mills are inquiring for wrought pipe and $25.50 delivered easily can be had for carloads for latter grade. There is nothing doing in railroad malleable here but bids of $35 delivered west are being made for this grade. The American Car & Foundry Co. bought 1000 tons of car wheels at $45 Berwick, Pa., and other consumers are bidding $44. The Crucible Steel Co. bought 5000 tons of low phosphorus scrap for Newark. Stove plate is strong and in some cases odd cars for foundry use are being sold at $33 delivered.

Can't Ship From New England

Boston, March 1.—The strengthening in heavy melting steel scrap in Pennsylvania did not have its usual reflection in the New England market because of the difficulty in making shipments. The New York, New Haven & Hartford railroad is accepting practically no scrap shipments for Pennsylvania points, and the Boston & Albany, while still accepting consignments, is tied up by lack of cars and inability to give switching service. Dealers are reluctant to make heavy purchases. Some shipments have been reported at slightly increased figures. Several hundred tons of heavy melting steel were sold at $43.40 at shipping point, and other sales made during the week were approximately at the same figure, although shading in some cases has been reported. Three hundred tons of cast scrap were sold to one foundry at $47, delivered.

Sentiment Is Weaker

New York, March 1.—While prices in the local scrap market are unchanged, a weakening in sentiment is evident. Some interests predict a drop of $1 in virtually all descriptions before the week is over. The existing weakness appears to lie in the fact that stocks generally are more plentiful than they have been in weeks. At the same time, it also appears that consumers are in a fairly good position, especially in view of the fact that back shipments are now being received more freely as the weather improves. During the past week, several of the railroads have lifted their embargoes on shipments over connecting lines, and all of the scrap yards again are in operation.

Recent Strength Temporary

Pittsburgh, March 2.—The recent show of strength in the open-hearth grades of scrap iron and steel, brought about by some fairly large purchases by a large independent steel company here disappeared when that factor covered its requirements and withdrew from the market. Purchases by this company are said to have been in excess of 10,000 tons, mostly heavy melting steel, for which it paid $29, delivered for the bulk of the tonnage. The quick reaction following the completion of this business makes it evident that the tonnage was supplied either from dealers' stocks or from shipments diverted from other consumers because of plant embargoes. Orders suspending shipments of material on contracts still are common with all steel companies, particularly those in the valley. Much reconsigning is necessary and the finding of a convenient place to put such tonnages usually is impossible except at prices attractive to the second buyer. While the market admittedly is soft on the steel works grades, neither dealers nor melters look upon this condition as more than temporary and expect the market to tighten with a restoration of more nearly normal transportation conditions. Hitherto, the easier tendency in the steel works grades of scrap has not extended to the foundry grades, and those kinds of material finding special uses. But on the present reaction somewhat more pressure to sell these latter classes has been observed and they, too, have dropped a little in price. The March scrap list of the Pennslyvania railroad, lines east, offers the smallest tonnage in several months. Only 12,645 gross tons are listed and the largest items are 1400 tons of No. 1 steel rails and 1200 tons of No. 1 heavy melting steel.

Sells 40,000 Tons in Pittsburgh

Buffalo, March 2.—Buffalo dealers are expected to ship two large tonnages of heavy melting steel on contracts just closed in the Pittsburgh district. One sale of 20,000 tons was made at $29, delivered Pittsburgh, and another of 20,000 tons at $29.50, Pittsburgh. This is equivalent to about $26.10, Buffalo. These sales may inaugurate a buying movement which has been scheduled for some time. Cars are beginning to come in and both mills and dealers are congested with inbound cars, representing shipments made over two weeks ago and held up by the storm.

Weakness Runs Further

Cleveland, March 2.—Scrap prices continue their downward trend. Heavy melting steel has dropped 25 cents to $25.50 and $26; axle turnings and bundled sheets are down 50 cents; old steel rails for melting $1.50, and large drop forge flashings 75 cents. Other grades are proportionately weak, but the trading in them has been insufficient to fix quotations definitely. Mills in the valley, out of this market for a few weeks, are expected to enter shortly. The McKinney Steel Co. continues embargoed. Dealers have been able to pick up sizable tonnages of melting steel in the valley at $27. Within another month railroad scrap will begin coming into the market, and this may contribute to further weakness.

Better Tone at Chicago

Chicago, March 2.—Although quotations on iron and steel scrap continue to decline slightly, the market shows a decidedly better feeling with some buying in spots. Demand in steel grades continues light, while scrap for foundries and iron mills is more active. The matter of car supply and labor is assuming much importance in this industry and is having a tendency to restrict the supply. Labor is difficult to obtain for loading and unloading cars, and scrap yards are unable to handle much scrap which needs preparation. Two railroad lists recently were withdrawn after being offered because labor could not be found to load it on cars. The Chicago & Northwestern offers 3700 tons, including 500 tons of No. 1 wrought, the Rock Island 5200 tons, including 1000 tons of No. 1 steel rail, 500 tons of No. 3 steel rail, 550 tons of No. 1 wrought, and 350 tons of No. 2 wrought, the Wabash 150 tons of cast scrap, and the Burlington road 230 tons.

Not Buying Much in St. Louis

St. Louis, Feb. 28.—The scrap market in this district is unsettled, and trading during the past week was in smaller volume than in a long time. There is no pressure of offerings, however, to induce lower prices. The desire to speculate also has subsided, dealers being unwilling to trade. The saving feature of the situation is the heavy consumption, all mills and foundries working actively. Steel plants are less intensively engaged than those using cast material, but the former are confidently anticipating a revival of buying by the railroads, and have completed extensive plans for coping with the demand. There were no lists before the market during the week, and it is doubtful if any will appear next week. The Pennsylvania Lines East have returned their offices to St. Louis, and it is expected that this road will market considerable of its scrap in St. Louis. The Helmbacker rolling mill department of the American Car & Foundry Co., on the east side, reopened this week, after a suspension of about one year. Two furnaces are in operation.

Tin-Plate Output

Principally Stocked for Lack of Cars —High Prices for Wasters

Pittsburgh, March 2.—The greater portion of recent production of tin plate has been going to warehouses because of the shortage of cars. Because of the extremely small shipments against contracts mill obligations remain extremely heavy, and the demand for spot

tonnages is quite sharp. Practically the only prompt tin plate available consists of wasters, and tonnages even of these are only a small fraction of what they are ordinarily. Sales of wasters or stock tin plate readily are being made at from $7.50 to $8.50 per box as against $7 per base box, the price for standard plate, which is the basis of the bulk of the obligations now on makers' books. In view of the fact that it will be well into the third quarter before present obligations of the manufacturers are met it appears a little doubtful that independent companies will open their books for third quarter business. The tonnage that any of the manufacturers can take for that period is likely to be extremely limited because of the size of present obligations. Export demands are heaviest from the far east and carry prices up well toward $10 per base, Pittsburgh, but almost no business of this sort is being accepted.

Expect Another Buying Movememt in Ore

Cleveland, March 2.—The iron ore market has settled down to a period of comparative inactivity, following the first rush of business, and little more is expected to be done until general conditions in the iron and steel trade become clearer. During the past week eastern furnaces took 500,000 tons, bringing the total purchased by interests in that district well over 2,000,000 tons, and Virginia furnaces also closed for additional tonnages, practically covering all their requirements.

Regardless of the fact that the initial buying movement was unusually heavy the leading furnace interests which take the largest tonnages are not oversupplied with ore. The market is in a healthy state, and if there is no interruption in operations large tonnages will be in demand as the season progresses. Prices are firm on all standard grades, but liberal concessions are being allowed on some "off quality" ore.

Strip Bookings Heavy

Pittsburgh, March 2.—Little headway is being made by the makers of strip still in reducing their obligations, which now conservatively are estimated to be equal to six months' capacity operations. Few makers lately have been getting particularly full shipments of billets, while the lack of cars and the railroad embargoes have played havoc with the movement of material from the mills. The freight tieup to New England is seriously affecting the movement of cold-rolled strip steel, and one maker in this district has had his mill down the greater part of the time during the past week to prevent further accumulations of finished material. Prompt tonnages of both hot and cold-rolled steel still are being sought, but are not easily placed because of the sold up condition of the mills. Some makers have established a base of 8.50c on cold-rolled steel, but others still are quoting 8.00c, while small sales also are being done up to 9.00c. Hot-rolled steel is selling at 5.00c, 5.25c, and 5.50c, base, with little of the uniformity of prices which usually prevails now apparent.

Bid Heavily for Sheets

Attractive Offers, However, Fail to Uncover Tonnages — Little Material to Be Available Until July — High Prices Paid

Youngstown, O., March 2.—Scarcity of all grades of sheets in this territory is becoming more pronounced. Attractive offers have litle effect in uncovering tonnages. Many of the mills are rolling back orders and, so far as can be learned, it will be impossible for consumers to obtain sheets from mills here much before July. The shortage of coal and closed cars have had much to do with the present tightness of the sheet market. Every maker here continues to refuse considerable business, which has been largely the cause of buyers turning to dealers and brokers for their supply of sheets. No set price for any grade of sheets, therefore, exists here. Recent sales of black show considerable spread, with prices ranging from 6.50c to 10.00c. Considerable tonnage of black and blue annealed grades was turned last week. Automobile makers are purchasing heavy consignments of high finished material whenever it is to be had. Prices seemingly are of minor importance to this class of the trade so long as the offering meets their specifications and the shipping date is attractive. Mills in the upper part of the valley are short of mill crews and galvanizing laborers. Four mills at the new plant of the Falcon Steel Co., Niles, O., got under way this week and officials contemplate placing three additional units under power next Monday. The jobbing mill now is being assembled and probably will be placed in operation toward the latter part of this month.

Fancy Prices for Prompt Tonnages

Pittsburgh, March 2.—Demands of the automobile manufacturers for early tonnages of sheets are still insistent. Illustrative of the prices paid is a sale of 5000 tons of black sheets to be shipped at the rate of 1000 tons a month, beginning with this month, at 9.00c, base. Although the business was placed through brokers, it is understood that the sheets will be provided by a middle western maker. General conditions with sheet manufacturers are much as they have been during the past few weeks. While the industry as a whole is operating at a comparatively high rate, production remains out of proportion with the number of mills in operation, and much finished material is piling up at practically all mills for want of cars in which to move it. Conditions in respect to car supplies have been somewhat better during the past few days with the American Sheet & Tin Plate Co., than they were recently.

High Prices for Export

Chicago, March 2.—Heavy demand for steel sheets for export is prevalent in this market, Central and South America, Australia and the Orient being the origin of most of this inquiry. Some small tonnages for late delivery this year have been taken, but most of the export inquiry is allowed to pass, as mills are heavily sold to the middle of the year and are unable to determine their condition for last half delivery. Consumers anxious to obtain further tonnage are bidding high for sheets, offering 7.50c for No. 28 gage black, 8.50c to 9.00c for galvanized and 6.00c for blue annealed.

Water Companies

Inquire Liberally For Cast Pipe—Demand For Mill Goods Heavy

New York, March 1.—A heavy demand from water companies and other private concerns is in evidence in the eastern cast iron pipe market, inquiries coming out more freely than in several weeks. Inquiries include a number of sizable lots, one being for 10,000 tons. Municipal demand remains dull, but business of this character is expected to develop before the end of this month, at which time the usual buying season begins. Manufacturers state, however, that there is sufficient business coming out from other sources to justify them in operating their plants at capacity were it possible. At present, due principally to the labor situation, eastern shops are running around 50 to 60 per cent.

Shipments Fairly Good

Pittsburgh, March 2.—While all makers of tubular goods are feeling the shortage of cars, the effect upon shipments from Pittsburgh plants appears to be rather less than it is in the Mahoning valley and in the Wheeling district. And in the latter districts, shipments have dwindled as much through a lack of production, due to the fuel situation, as through a lack of cars for moving the finished material. No letup to speak of is noted in the demand for either oil country or merchant pipe, but little of the business offered is getting any attention at present and no change is likely in this respect until after the manufacturers have succeeded in cutting down their old obligations. The latest advance in Pennsylvania crude oil to approximately $6 per barrel, at the well, is stimulating the demand for drive pipe, not so much for the purpose of getting oil but with an idea of striking water which will flood the oil wells and drive up the oil faster.

Chicago Cuts Inquiry

Chicago, March 2.—On its inquiry for 20,000 tons of cast iron pipe, the city of Chicago has awarded 15,000 tons to the United States Cast Iron Pipe & Foundry Co., reducing the tonnage to meet the funds available for this purpose. The same maker has been awarded 1500 tons by the city of St. Louis. Jackson, Mich., has bought 900 tons from the Lynchburg Foundry Co. Bids recently taken at Milwaukee on 800 tons have been rejected and will be readvertised. Bids will be opened March 5 at Akron, O., on 3155 tons of pipe and fittings.

Total Awards Are Fair

Chicago Reports 12,000 Tons Placed in Week and New York a Larger Aggregate—Fabricated Work Around $150 Erected

Chicago, March 2.—In spite of cost of structural material and difficulties in building, a number of fairly large tonnages were placed in western territory last week. Awards of the week totaled about 12,000 tons. The largest project involves 3900 tons for the Belden hotel, Chicago, which will be fabricated by the American Bridge Co. The same fabricator also took 1300 tons for a building for A. Starr Best, Chicago, and 1800 tons for a plant for the Seng Co., also at Chicago. The McClintic-Marshall Co. has taken 1822 tons for the Pacific Telephone & Telegraph Co., at Seattle, and the Minneapolis Steel & Machinery Co. 1800 tons for the Donaldson block at Minneapolis. A number of building projects have just come to the front in Chicago, which will be active inquiries shortly. The Loridan hotel, Chicago, will require 5000 tons.

Important Awards Are Made

New York, March 1.—Featuring the eastern structural market are several important awards. One involves 5600 tons for the Christian Science building at Madison avenue and Forty-third street, another 3000 tons for the Borden Milk Co., a third 2000 tons for the Loft Candy Co., Long Island City, and still another 1200 for the International Sporting club, in this city. For the Atmospheric Nitrogen Corp., Syracuse, 900 tons were placed, and another larger lot for the New York stock exchange also is reported as closed. New inquiry is not large.

Prices on fabricated material appear to be around $150 a ton, erected. A lot of 300 tons recently went at $200 a ton, erected, but this was a special lot. Deliveries run about four months.

Take Large Tonnage at 4.00c

Philadelphia, March 2.—A large shape maker who recently opened its books for second quarter at 4.00c, Pittsburgh, has taken considerable tonnage at this figure, and an eastern mill which quoted this figure to keep away business also has accepted some tonnage at this figure. Considerable tonnage has been booked by an eastern mill at prices equivalent to 3.75c to 3.90c, Pittsburgh. This included 6000 tons of ship shapes for Japan, and 1000 for Italy. A Pittsburgh interest is taking orders for some second quarter shapes at 3.10c, Pittsburgh, but only from regular customers. Eastern mill operations continue greatly reduced by reason of the coal shortage.

Structural Inquiry Declines

Pittsburgh, March 2.—Inquiries against new structural projects have tapered off considerably. Figures for the week ending Feb. 21 compiled by the Bridge Builders and Structural society show that inquiries were made that week for about 26,000 tons, as against about 70,000 tons in the previous week. There has been a relative decline in the awards, which recently have not been higher than 20 per cent of the tonnages inquired for. It is understood that quotations against some recent inquiries have run as high as $150 per ton, erected, or about 50 per cent higher than the average run of bids a few months ago. Practically none of the makers of plain material now will take on business for extended delivery. It is stated that the Carnegie Steel Co., although still quoting plain material at 2.45c, base, for structural beams and 2.65c for plates, is declining to enter any new business. Hitherto, this company has been willing to take on new bookings without guarantees of specific deliveries at the old prices. The Bethlehem Steel Co. also is practically out of the market and makers who have any tonnage appear to prefer to sell on spot and take advantage of the present high prices rather than to commit themselves on long-time obligations. Prices of plain material take a wide range, running anywhere from 2.70c to 4.00c and in some cases higher, but there does not appear to be much basis for a price of less than 3.50c on early tonnages.

Warehouse Price Advanced

Cleveland, March 2.—Scarcity of structural shapes is reflected in an advance of $20 per ton in the warehouse price of plain shapes in the Cleveland market, the price now being 5.10c. Little business is being figured, and the two leading interests in this district continue out of the market, excepting business only at mill's convenience. The Cleveland Discount Co. has announced plans to build a $4,000,000 office building, estimated to require 5000 tons of shapes, but bids have not yet been invited.

CONTRACTS AWARDED

Belden hotel, Chicago, 3900 tons, to American Bridge Co.

Office building for the Pacific Telephone & Telegraph Co., Seattle, 1822 tons, to McClintic-Marshall Co.

Donaldson block at Minneapolis, 1800 tons, to Minneapolis Steel & Machinery Co.

Industrial plant for the Seng Co., Chicago, 1800 tons, to American Bridge Co.

Building for A. Starr Best Co., Chicago, 1300 tons, to American Bridge Co.

Structural steel for extensions of Larrowe Milling Co., Rossford, O., 270 tons, to Toledo Bridge & Crane Co.

Machine and boiler shop for Rowley Bros., Chicago, 212 tons, to Continental Bridge Co.

Highway spans for Grundy county, Iowa, 108 tons, to Alfred Olson Construction Co., Miller-Fifield Construction Co., Waterloo Construction Co., all of Waterloo, Iowa.

Furnace bindings for the American Rolling Mill Co., Middletown, O.; the Otis Steel Co., Cleveland, and the Republic Iron & Steel Co., Youngstown, 500 tons to the Jones & Laughlin Steel Co.

Warehouse for the Pittsburgh Plate Glass Co., Ford City, Pa., 250 tons to the Jones & Laughlin Steel Co.

Addition to plant of National Carbon Co., Niagara Falls, N. Y., 270 tons, to Kellogg Structural Steel Co., Buffalo.

Gray iron foundry addition for Gisholt Machine Co., Madison, Wis., 600 tons to Worden-Allen Co.

Head-frame and washing plant for Pickands, Mather & Co. at Hibbing, Minn., 450 tons to Worden-Allen Co.

Alterations for Worth Steel Co., Claymont, Del., 750 tons, reported placed with Jones & Laughlin.

Foundry for Chambersburg Engineering Co., Chambersburg, Pa., 400 tons, to independent shop.

Boiler house for Phoenix Utilities Co., Hauto, Pa., 250 tons, to McClintic-Marshall Co.

Christian Science building Madison avenue and Forty-third street, New York city, 5600 tons, to American Bridge Co.

Plant buildings for Atmospheric Nitrogen Corp., Syracuse, N. Y., 900 tons, to Lackawanna Bridge Co.

Building for Borden Milk Co., New York City, 3000 tons, erection work to Post & McCord, fabrication expected to be by American Bridge Co.

Building for International Sporting Club, New York City, erection to Post & McCord, fabrication expected to be by American Bridge Co.

Addition to New York stock exchange, New York city, several hundred tons, reported placed with Levering & Garrigues.

Factory addition for Loft Candy Co., Long Island City, N. Y., 2000 tons, to George A. Just.

School No. 50, New York city, 500 tons, general contract to the James McArthur Co., Brooklyn.

Extension to plant of the Diebold Lock & Safe Co., Canton, O., 500 tons, to the McClintic-Marshall Co.

Open-hearth building for the Mansfield Sheet & Tin Plate Co., Mansfield, O., 2000 tons, to the McClintic-Marshall Co.

Power house for the Metropolitan Edison Co., Reading, Pa., 700 tons, to the McClintic-Marshall Co.

Engine house for the Ligonier Valley railroad, 150 tons, to the McClintic-Marshall Co.

Shop for National Supply Co., Toledo, O., 2500 tons to the Toledo Bridge & Crane Co.

Powerhouse for Ulhlein Food Products Co., Milwaukee, 200 tons to Worden-Allen Co.

Body factory for Nash Motors Co., Kenosha, Wis., 1000 tons to American Bridge Co.

Additional steel for open-hearth foundry extension for Interstate Iron & Steel Co. at South Chicago, 300 tons to Worden-Allen Co., making total of 1500 tons.

CONTRACTS PENDING

Loridan hotel, Chicago, 5000 tons, bids asked.

American Medical association building, Chicago, 350 tons, bids asked.

Building for Mansfield Sheet & Tin Plate Co., Mansfield, O., 500 tons; bids being taken.

Building for the Massillon Rolling Mill Co., 1500 tons, bids being taken.

Bridge work for the Boston & Albany railroad, 200 tons, bids being taken.

Bridge for the Goodyear Tire & Rubber Co., Akron, O., 450 tons, bids being taken.

Coated Nails

Covered by New Extra Card—Sell Plain Wire at 3.75c

Pittsburgh, March 2.—Following closely the issuance of the new bright nail card by some of the independent manufacturers, the Pittsburgh Steel Co. has put out a new card of extras on cement coated nails and other independent companies are likely to follow suit. As was the case with bright nails, extras on the cement coated nails are made to conform more nearly with manufacturing costs than did the former schedules. The increased revenue from the new extras permits a lowering of the base, which now is $3.35 per count keg, Pittsburgh, against $3.50, or more, on sales previously made. The new card is effective as of Feb. 16, last. The Jones & Laughlin Steel Co. has issued a new card of extras on bright nails, dated March 1. New business on the new scale of extras is no larger than under the old schedules, but this is due to unwillingness of makers to accept much new business rather than to a lack of demands. Demand, in fact, is heavy, with buyers trying every way to secure some early shipments. One Pittsburgh jobber is drawing supplies in motor trucks from a mill more than 20 miles out of Pittsburgh. A Pittsburgh producer still is in a critical position as to mill operations because of the lack of cars, which had piled up material at the plant to a point where not much more can be stored.

To Quote on Second Quarter

Philadelphia, March 2.—A large wiremaker is preparing to open books for the second quarter. It has not yet decided on prices, but they prob-

ably will be around 4.25c to 4.50c, Pittsburgh, for nails; 4.85c to 5.00c on barbed wire, and 3.75c to 4.00c on plain wire. Independents now are using the new nail extras.

Place Wire at 3.75c

Cleveland, March 2.—Several consumers of manufacturers' wire have been placing tonnages with one producer which aggregate over 1000 tons at 3.75c, Pittsburgh, which is an advance of 25c per 100 pounds over the previous highest price made by independent makers. This is for delivery within 60 days, guaranteed. Another independent situated in the outer Chicago district is selling wire nails at $4.65, Pittsburgh, per keg, these sales being made in mixed carloads. The leading producer of wire products has not yet announced a new wire extra card about which there has been some speculation in the trade. It has not opened its books for second quarter business as yet. Some local jobbers with preferred mill relations are selling nails at $3.75 and $4.00 but are confining sales to three and five-keg lots to single customers.

Still Unable to Ship

Chicago, March 2.—Although supply of cars for wire mills has been improving in some respects, mills are still unable to ship as much wire and nails as they produce, and accumulations are increasing. This is not as marked at western mills as in the east, as there is not the same condition of embargo, but it is not possible to move entire production. Only regular customers are able to book further business with the leading interest.

Semifinished Advances

Prices on Practically All Forms of Material Moved Up at Pittsburgh — Sales of Sheet Bars Reported at $84

Pittsburgh, March 1.—Further advances have been established in the past week on practically all forms of semifinished steel, the largest being in sheet bars. Sales of several thousand tons of this form of material for March shipment have been made within the past few days as high as $90, Pittsburgh. This followed sales at $84. Sales by one independent interest from tonnages released by the congestion of finishing departments have reached a round total. Due to the fact that black 9.00c, base, for immediate delivery, there sheets recently have sold as high as would be a substantial profit for a manufacturer even at these prices for sheet bars, allowing a conversion charge of around $35 a ton. On a recent conversion purchase of sheet bars a price as high as $80 was paid, and it is believed that the sale at the higher figures also was on a conversion deal.

The market on rerolling billets is rather indefinite at present as demands are not quite so numerous or insistent as they were recently. This form of steel is quotable from $60 to $70, but makers are not inclined to accept the lower figure while the higher price is beyond the ideas of the average finishing mill. Sales of high carbon forging billets for second quarter delivery are noted at $90, Pittsburgh, while a sale of 600 tons of 3½ per cent nickel billets recently was closed in this market at slightly under 7.00c per pound.

Soft wire rods are quotable on sales from $65 to $70, Pittsburgh, for No. 5 common rods, while some soft free cutting bessemer rods have been sold at $80. On high carbon rods the market still ranges from $75 to $100.

Steel works activities both here and in the valley districts have been considerably restricted by the scarcity of coal and gas. Several cold days last week practically cut off the entire supply of natural gas for the Pittsburgh district steel plants.

Sales Small in East

Philadelphia, March 2.—Sales of semifinished in the district during the week were small. Prices continue unchanged at $70, Pittsburgh, for forging and $57.50 to $60, Pittsburgh, for rerolling billets.

No Material Available

Youngstown, O., March 2.—Makers of semifinished material in this territory have no material to offer for the second quarter and are doing little contracting for the next three months. The present shortage of coal has hindered steel production here lately with the result that makers have no semifinished material available after supplying their own mills. Shipments to old time customers are being held to a minimum. No sales of billets or slabs are reported. Regular customers probably could contract for sheet bars at $75, but transient buyers could not do better than $80, mill, if conditions were such that this material could be had.

More Sheet Bars Offered

Cleveland, March 2.—Because of the congestion in finished steel departments there has been some backing up of semifinished material with various mills and this has accounted for more or less offering of the latter on the open market. This has been particularly true in sheet bars, the offering of which in this territory has increased considerably. Sales of 5000 to 6000 tons for shipment in March were made in this district at $80 Pittsburgh. Since then the market has advanced, and $90 Pittsburgh has been paid. A Chicago mill has been offering heavy weight sheet bars in this territory on the basis of $75 Chicago.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.*	†Lead New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
Feb. 25	19.00	65.00	9.00	9.00	33.00	11.87½	43.00
Feb. 26	18.75	63.00	9.00	8.90	33.00	11.87½	43.00
Feb. 27	18.75	62.25	9.00	8.75	33.00	11.87½	43.00
March 1	18.75	62.50	9.00	8.75	33.00	11.87½	43.00
March 2	18.75	63.50	9.00	8.75	33.00	11.87½	43.00

*Future shipment from Singapore or London.
†American Smelting & Refining Co.'s price.
‡Producers.

NEW YORK, March 2.—Tin furnished leading interest in the nonferrous metal markets the past week, with the sharp break of £19 on Feb. 26 and 27 following the rise to the record price of £419 Feb. 25. Then the market started back up, due to the rise at London and at Singapore, the latter reaching a high record at the end of last week, the latest quotation received. American consumers have not participated in the market to any extent in recent weeks and when the London market broke, the decline in the New York market from 65.00 to 61.00c for Straits tin did not stimulate buying. The rise in London is ascribed to speculative activity on the part of people outside the tin trade who have funds to gamble with and who are at this time barred from other commodity markets and the stock market. Importers here have been moving cautiously, believing the setback in London may be only temporary to be followed shortly by a recovery and further sharp advances.

The copper producers came down a peg as regards prices for electrolytic copper for second quarter, doing some business around 18.75c, delivered, for this position. The so-called outside market whipsawed from 18.50 to 19.00c and back to 18.50c, but this market remains very narrow, supplies of copper being limited. Casting copper prices ranged from 18.37½c to 18.50c for carload lots, some holders asking 18.75c for less than carloads. Lake was steady at around 19.00c.

The American Smelting & Refining Co. advanced its lead price Feb. 24 $5 a ton to 9.00c, New York. The outside lead market ranged from 9.25 to 9.50c during the week, sales of carloads for prompt shipment being reported at the higher figure toward the close of the week. The lead situation continues strong, sellers being able to obtain almost any price they ask, due to the limited supplies obtainable. The London lead market reacted on profit taking resales by speculators.

The zinc market softened about $5 a ton, from 9.00c a pound, East St. Louis, on Feb. 24, to 8.75c, on Feb. 27. Business has been quiet, export business being impossible by reason of the low exchange rates, while domestic consumers, who bought sparring for March shipment recently, have mostly again withdrawn. However, the zinc market appears fundamentally sound and it would require only a little buying, either domestic or export, to bring about a recovery. High grade zinc has sold well recently at 9.50c, delivered.

The antimony market has been steady at 11.75 to 12.00c, New York, for spot metal, with a good demand.

The aluminum market has been strong, foreigners having advanced their prices from around £172 to £180 for virgin ingot, 98 to 99 per cent. Importers here are asking 32.00c for virgin ingot for future shipment and 32.50c to 33.00c for spot deliveries. Sheets are extremely scarce.

Traffic Is Better

New York, March 1.—While local warehouse interests are able to move freight out of their warehouses with greater freedom, various embargoes being lifted in New England and elsewhere and trucking facilities being better, jobbers state they are still having considerable difficulty in getting shipments through now enroute from the mills.

Export Situation More Promising

Big Producers Expected to Open Third and Fourth Quarter Books in Few Days — Some Surplus Material Is Being Offered—Many New Foreign Demands Made on the Market but Tonnage Is Lacking

NEW YORK, March 1.—Further evidence of an important change in the trend of steel exports has been disclosed during the past week. Some exporters believe the present deadlock on export business is likely to be removed soon and that there may be some easing of prices. During the past two months little, if any, steel has been sold to Europe, while the federal reserve bank authorities have been bending their energies to bring about deflation of the credit situation. Whether or not the steel market will be affected by these efforts, however, cannot be forecast with any degree of accuracy at this time.

Various exporters report there has been heavier selling of surplus steel stocks the past week or two. The offerings are in many instances made by domestic consumers of steel. Some domestic consumers of American mill products evidently have purchased more material than they think they can comfortably handle and they are willing to sell some of their surplus to the exporters. This tendency, nevertheless, has not as yet developed into a general movement and for the most part the prices continue high. In one instance it was discovered that a middlewestern mill has offered an exporter some mild steel bars at 4.00c, base. This was a firm offer and much below former quotations. The mill offered to deliver the bars during June next.

Exporters have not been buying for deliveries later than June, chiefly because the mills have refused to open their books for third quarter. Following the report of last week that one of the big producers would open his third quarter books within a few days, it has been discovered that many independent mills are preparing to take a similar step. Rumors that the mills are about prepared to take on third quarter business have been frequent in this market during the past week.

In addition to the bar quotation there have been other developments tending to suggest an easier situation. One exporter had contracted for a supply of tin plate which the mill had announced it could not deliver before June. This week the mill telephoned the exporter that one-half of the order has been shipped and that the remainder would be shipped this month. A Chinese order for 2000 boxes of tin plate was cancelled last week because the purchaser found that he could get the same material in Japan cheaper. The Japanese sold the tin plate upon the basis of $8.25 a base box. Japan has loaded up heavily with tin plate and while the demand from the Far East for this particular product continues very strong, the resale at a lower price evidently was the result of overstocking by some individual purchaser. Tin plate in this market has been quoted as high as $10 and $12, Pittsburgh.

Sheets have been offered in this market for 9.50c Pittsburgh, and bars have been quoted at 4.15c. Some foreign customers have been forced to pay prices corresponding to these quotations because the mills have been closed to foreign contracts since Jan. 1. The Far East has been asking recently for rails and while some business has been closed, the numerous small inquiries have gone unanswered. The exporter is asked $90 f.a.s., New York, for heavy rails, making the c.i.f. price in Japan $103. Could a satisfactory price be quoted a large tonnage of rails would be disposed of in Japan and a considerable tonnage would be sold to China. On the present basis, however, it is impossible to do any business.

Most of the exporters declare they have signed up no business during the past week. They insist that they will not sign up any until large producing interests open their books for third quarter. According to reports current here last week the leading export steel interest is accepting orders for plates, shapes and bars for third and fourth quarter delivery. There are no inquiries in the market from allied Europe, although England has occasionally asked for something merely to sound out the temper of the American sellers. There is a constant inquiry in the market for tin plate from Portugal, Sweden and Norway. Some very unusual contracts could be made were the supply available.

Unconfirmed reports have been received here to the effect that English builders have been awarded the contract for Belgian locomotives. American builders obtained the first of these contracts and were expecting a supplemental order for at least 50 more locomotives.

South America is represented by a considerable demand for nails, iron bars and wire. South America has also been inquiring for structurals. Mexico has been asking for tin plate and it is understood that some orders have been placed. India has been asking for structurals, plates and bars. The Far East has developed an active demand for plates. The foreign sheet sales now possible are said to be more than ample to take up the total productive capacity of American mills for a year.

Sales are rare. The exception is the case of Japan and the sales made there have been extremely small and upon some special arrangement. Some 5000 kegs of nails were sold to Japan but this sale was made out of a lot that had been contracted for many weeks ago. The nails were disposed of upon the basis of $6.50, Pittsburgh. Sales of 800 tons of bars and about 300 tons of plates to Japan also were closed. New Zealand recently approached American exporters with inquiries for nails, staples, galvanized wire, barbed wire, plain galvanized sheets, tin plate, galvanized and black pipe, and corrugated sheets. There has also been some inquiry from Australia for nails and tin plate.

During the past week the shipping board revised its schedule of freight rates to meet in part the freight quotations made by the private lines. The new schedule of rates applies to the Orient as well as to Europe. A reduction in ocean freight rates will not have much effect upon the export market for steel under the present circumstances. It is not a question of reducing the c.i.f. quotation $1 a ton or so, but of being able to find the material within some reasonable time and price. The reduction in the ocean freight rates, however, will have its good influence in that it will offset the anticipated advance in the inland freight rates, now that the railroads have been returned to their private owners.

The Aberthaw Construction Co., Boston, is investigating what effect vibration has upon industrial equipment and workmen. The data and results developed by this investigation will be published.

Continue Coal and Coke Control

Hines to Continue to Perform Fuel Administration's Functions in Distribution of Supplies—Price Regulations Are Not Lifted, and Advances May be Made After New Wage Levels Are Agreed On

WASHINGTON, March 2.—President Wilson's executive order last Saturady night continuing the fuel distribution powers of Director General Hines, averted what otherwise might have been an embarrassing situation following the return of the railroads to private management March 1. By the President's decree, Mr. Hines will continue to perform that function of the fuel administration by which the distribution of bituminous coal and coke is regulated to offset the difficulties, growing out of the miners' strike, in supplying consumers with their urgent requirements.

Mr. Hines in no way is to have charge of coal or coke prices. Up to late Saturday evening, with government relinquishment of railroad control little more than 24 hours away, it appeared there would be no relief in sight for coal consumers whose supplies had been depleted because of the coal strike. Until the President spoke confusion prevailed, with every government department interested in the coal problem besieged with letters, telegrams, telephone messages, etc., for information as to what would happen beginning March 1.

With coal distribution in the hands of Mr. Hines at that time there was doubt in some quarters that the director general had legal authority to perform acts assigned to the fuel administration after that department practically ceased to exist, following the resignation of Fuel Administrator Garfield. The President's order, however, cleared up doubt on both of these points, decreeing that certain powers given by Garfield to Hines in orders dated Oct. 31 and Dec. 8, 1919, relative to delivery, use, consumption, distribution and apportionment of coal and coke would be continued by Hines. These powers did not include price fixing, and as no order of either Garfield, before his resignation, or of the President, afterward, has revoked the war prices which the fuel administrator re-established effective Nov. 1, fixed coal prices are to be continued until further order of the President.

The government coal commission, headed by Henry M. Robinson, appointed to settle wage matters in disputes between miners and operators, likely will report to the President next Monday, four days ahead of the specified 60-day period. As any wage award unquestionably will affect prices it is probable that the President, or perhaps somebody to be suggested by the commission, will issue the necessary order adjusting prices to meet the proposed new wage level. Meanwhile, there apparently is no organization to enforce the fuel administration prices, unless it be the department of justice.

While the central coal committee, which will be continued under Mr. Hines, has not been generally exercising authority over fuel distribution, it has been and will continue to act in supplying coal to railroads and other consumers in accord with priority regulations established by Mr. Garfield. The Tidewater Coal exchange will co-operate with the committee.

An executive order also was issued Saturday night naming a committee of four to re-establish a tidewater coal exchange under direction of Director General Walker D. Hines, to supervise the export of coal until April 30. The committee consists of J. W. Howe, present commissioner, Tidewater Coal Exchange; Rembrant Peale, formerly of the fuel administration and now a member of the coal commission; F. M. Whitaker, of the central coal committee, and J. E. Fisher.

The order of the President conferring on the director general the powers stated is as follows:

"Whereas the United States fuel administrator by orders dated Oct. 31, 1919 and Dec. 8, 1919 conferred certain powers upon the director general of railroads and his representatives, acting by and under his authority, relative to the delivery use, consumption distribution and apportionment of coal, and whereas doubts have arisen as to whether the powers thereby conferred upon the director general of railroads and his representatives will continue in effect after 12:1 o'clock a. m. on the first day of March, 1920;

"Now, therefore, I, Woodrow Wilson, President of the United States, pursuant to the authority conferred upon me by the act of congress approved Aug. 10, 1917, entitled 'an act to provide further for the national security and defense by encouraging the production, conserving the supply and controlling the distribution of food products and fuel,' and other powers vested in me by law, do hereby order and direct that the director general of railroads and his representative shall continue after 12:1 o'clock a. m. on the first day of March, 1920, to have and exercise the powers described in the aforesaid orders of Oct. 31, 1919, and Dec. 8, 1919.

(Signed) "WOODROW WILSON."

How much longer even a mild exercise of the distribution functions will have to be administered is problematical, but with the coming of spring consumption of fuel will lessen, which, with continued good productive efforts in the coal fields, will tend toward a free movement of coal and coke.

Consider Central Federal Purchasing Bureau

Washington, March 2.—Savings of millions of dollars annually, elimination of red tape in purchasing, and more expeditious delivery of supplies are the objects of legislation being considered by the house committee on appropriations looking to the co-ordination into one general independent bureau of the approximately 100 purchasing agencies of the government. An example of the economy provided through a centralized bureau, together with facilitated delivery, it is said, is the operation in Washington of the government coal yard, under the bureau of mines, for furnishing fuel to all government establishments in the District of Columbia. Another benefit, it is said, comes through lowered freight rates. The coal yard plan is recognized as being only a limited operation, but it is contended it supplies an index to what may be accomplished. A general supply committee is suggested as the federal agency to develop and administer the proposed plan of a centralized purchasing bureau.

Operate New Sheet Mills

Four hot mills at the new plant of the Falcon Steel Co., Niles, O., began rolling Monday. Officials plan to get three additional units under way by next Monday and the jobbing mill by the last of this month. The eight mills are designed to roll 70,000 tons of black and blue annealed sheets annually. All sheet and pair furnaces are heated with powdered coal. The plant is located on a 114-acre site on the outskirts and northwest of Niles, O. The Falcon company is capitalized with $1,000,000 preferred and $1,500,000 common stock. Lloyd Booth is president and Paul Wick, vice president and general manager.

Relight 18 Furnaces in February

Total Production of Pig Iron Below January but Average Daily Shows Big Gain—Fuel Shortage Has Little Effect on Furnace Activity—Both Merchant and Nonmerchant Plants Show Improvement

FOR the third consecutive month production of coke and anthracite pig iron continued to show improvement although the total output for February, due to the 29-day month, failed by 38,000 tons to equal the figure set in January. Notable increase in stack activity with a higher average daily output indicated the uptrend in production. The total output for January, however, still remains the highest since March, 1919, the month preceding the decline during the early part of last year.

AVERAGE DAILY PRODUCTION

	1920	1919	1918	1917	1916
Jan.	97,172	106,654	77,523	101,930	102,319
Feb.	102,547	105,270	83,794	94,641	106,157
March		99,614	103,548	105,026	107,343
April		82,479	109,112	110,936	107,517
May		67,991	111,351	110,119	108,535
June		70,467	110,538	108,675	107,127
July		78,200	109,954	107,659	103,907
Aug.		88,453	108,983	104,483	103,156
Sept.		82,692	113,774	104,691	106,935
Oct.		60,142	112,335	106,332	113,167
Nov.		80,244	111,595	106,620	110,593
Dec.		84,711	110,602	93,077	102,715
Av.	99,859	83,910	105,293	104,562	106,610

Total production for February was 2,973,859 gross tons or a loss of 38,514 tons from the output of 3,012,373 tons during January. On the basis of average daily production, this represents an output of 102,547 tons per day in February and a gain of 5374 tons over the January daily average of 97,172 tons. This improvement is 5.37 per cent and compares with the gain of 14.9 per cent made in January over December. On the basis of a 31-day month, the February production would have been in the neighborhood of 3,179,000 tons or about 167,000 tons higher than in January.

Steelworks or nonmerchant stacks in February produced 2,226,270 tons or 41,477 tons less than the 2,267,747 tons produced in January. Reduced to a daily basis, this is an average of 76,768 tons, a gain of 3615 tons over the 73,153 tons per day produced in January. This is an improvement of 4.94 per cent compared with an increase of 16.3 per cent during the previous month. Merchant iron output for the past month was 714,118 tons or a loss of 2456 tons from the 716,574 tons made in January. This represents an average daily production of 24,625 tons and a gain of 1510 tons over the previous month's average of 23,115 tons per day. This increase of 6.54 per cent compares with the January gain of 9.37 per cent. Unlike the previous month, the greatest percentage of gain was shown by the merchant stacks.

On Feb. 29, the number of stacks in blast totaled 303 compared with 285 in blast on Jan. 31, making a net gain of 18. Furnace activities show that 15 nonmerchant stacks were blown in and three were blown out, resulting in a net gain of 12 stacks. Ten merchant stacks were blown in and four were blown out, making a net gain of six stacks. The 303 furnaces in operation on the last day of the month were the highest number active since February, 1919, when 311 were in blast. In January, 23 additional furnaces were placed in operation.

Spiegeleisen showed improvement in February with a production of 11,755 tons or a gain of 5852 tons over the 5903 tons made in January. Ferro production, however, showed a small loss with a total output of 21,716 tons, a decrease of 433 tons from the January figure of 22,149 tons.

MONTHLY PRODUCTION

	1920	1919	1918
January	3,012,373	3,306,279	2,403,227
February	2,973,859	2,947,555	2,318,242
March	.....	3,088,023	3,209,996
April	.....	2,474,374	3,273,355
May	.....	2,107,729	3,451,884
June	.....	2,114,028	3,316,148
Total 1st half..	5,986,232	16,037,988	17,972,852
July	.....	2,424,212	3,408,584
August	.....	2,742,081	3,378,479
September	.....	2,480,790	3,413,223
October	.....	1,864,424	3,482,392
November	.....	2,407,369	3,347,844
December	.....	2,626,074	3,434,114
Total 2d half..	.....	14,544,950	20,464,636
Grand total..	5,986,232	30,582,938	38,437,488

Steel & Tube Co. Building Bessemer Plant

Chicago, March 2.—The Steel & Tube Co. of America has started construction of a bessemer department at its Indiana Harbor plant to supplement the converter which has been operating at South Chicago since the steel plant was built. It will consist of a scrap and pig yard, cupola house, mixer house, converter house, office building and power plant. The scrap and pig yard is 79 x 140 feet, and the cupola building, 40 x 66 feet. The latter will contain three cupolas of 20 tons each, to be built by the Pennsylvania Engineering Co.

The mixer building will be 66 x 75 feet and will contain a 600-ton hot metal mixer built by John Mohr & Sons, and will be served by a 100-ton crane built by the Morgan Engineering Co., Alliance, O. The converter building is 68 x 190 feet, equipped with two 15-ton converters arranged to blow in opposite directions and served by a hydraulic center crane. The blowers were supplied by the Pennsylvania Engineering Co.

Work has been started on foundations, and it is hoped to have the plant ready for operation by Oct. 1.

FEBRUARY PIG IRON

States	No. of Stacks	No. in blast last day of month: Feb.	Jan.	Total tonnage made: Merchant	Nonmerchant	Totals: Feb.	Jan.
Pennsylvania	160	123	120	214,213	944,288	1,158,501	1,223,896
Ohio	79	65	62	145,180	589,188	734,368	699,667
Alabama	45	21	23	106,675	78,623	185,298	204,455
Virginia	10	10	7	32,431	.....	32,431	25,052
New York	28	18	15	74,558	84,111	158,669	153,922
New Jersey	5	1	0	1,961	.....	1,961	.....
Illinois	25	20	17	41,767	217,066	258,833	273,587
Colorado	0	3	3				
Indiana	16	14	14	37,735	255,860	293,595	299,088
Maryland	4	4	4				
Wisconsin	6	3	3				
Kentucky	7	5	3				
Tennessee	16	8	8	40,073	33,795	73,868	52,305
West Virginia	5	4	2				
Washington	1	0	0				
Georgia	2	0	0				
Texas	1	0	0				
Minnesota	3	2	2	19,525	23,339	42,864	52,349
Michigan	3	3	2				
Missouri	1	0	0				
Spiegel—All states	..	..	..	.....	.....	11,755	5,903
Ferro—All states	..	..	..	.....	.....	21,716	22,149
Totals	432	303	285	714,118	2,226,270	2,973,859	3,012,373

Steel Corporation Wins Trust Suit

Majority Opinion of United States Supreme Court Holds Combination Has Not Violated Sherman Act—Size and Inherent Powers Declared Not Inimical to Public Welfare — Three Justices Concur in Minority Opinion Ordering Dissolution

THE United States Steel Corp. by its organization or practices has not violated the law of the land and hence its present form and policies may be continued without governmental interference.

This momentous decision was handed down by the United States Supreme Court at Washington Tuesday afternoon. It was rendered through Justice McKenna, and concurred in by Chief Justice White, Justice Vandeventier and Justice Holmes the four representing the majority opinion. A dissenting opinion was rendered through Justice Day, concurred in Justice Pitney and Justice Clarke, making a favorable opinion by the narrow margin of four to three.

Two members of the court, Justice McReynolds and Justice Brandeis did not participate in either the hearing of the suit, or the decision. The former was disqualified because as attorney general he had prosecuted the case, while Justice Brandeis took no part in the case because during the hearings before the interstate commerce committee of the senate in 1911, he expressed views against socalled business combinations.

The decision of Supreme Court by majority in effect holds that since 1911 when the suit was instituted against it under President Taft's administration before the United States district court of New Jersey, the Steel corporation has committed no act in violation of law. It further holds that law does not make mere size or the existence of an unexerted power, an offense. It requires overt acts and trusts to its prohibition of them and its power to repress or punish them, it is pointed out, and does not compel competition nor require all that is possible.

The decision explains distinctions between the Steel corporation and the Standard Oil and American Tobacco cases, stating that in the case decision further holds that the government is inconsistent in trying to dissolve the Steel corporation as to domestic trade and at the same time preserve its foreign trade.

In concluding the majority opinion, the justices say they are unable to see that the public interest would be served by yielding to the contention of the government respecting the dissolution of the corporation or the separation from it of some of its subsidiaries.

The dissenting opinion takes sharp issue with the majority and says the record leaves no fair room for doubt that the Steel corporation and subsidiary companies were formed in violation of the Sherman act. It holds the Steel corporation violated the law in its formation and by its immediate practices. The power thus obtained from a combination of resources was almost unlimited in an aggregation of competing organizations, it is asserted, and it had within its control the domination of trade, and the ability to fix prices and to restrain free flow of commerce upon a scale heretofore unapproached in the history of corporation organization in this country.

Justice Day says he cannot yield assent to the proposition that this combination has not acquired a dominant position in the trade which enables it to control prices and production when it sees fit to exert that power. That the exercise of the power, he says, may be withheld, or exerted with "forebearing benevolence, does not place such a combination beyond the authority of the statute which was intended to prohibit their formation, and when formed, to deprive them of the power unlawfully attained."

Holds Merger Serves Public Interest

AFTER reviewing the opinions of lower court which were reached by Judge Buffington on one hand and by Judges Woolley and Hunt on the other, by different courses of reasoning, the majority opinion of the supreme court adopts largely the view of the latter. The opinion of Judges Woolley and Hunt expressed the veiw that the original purpose of the formation of the Steel corporation was illegal but that the powers of the combination were never abused nor was unfair competition practiced and that therefore it was not a monopoly or a combination in restraint of trade.

"Both opinions were clear and confident that the power of the Corporation never did and does not now reach to monopoly, and there review of the evidence, and our independent examination of it, enables us to elect between their respective estimates of it, and we concur in the main with that of Judges Woolley and Hunt," says the majority opinion of the supreme court. "And we add no comment except, it may be, that they underestimated the influence of the tendency and movement to integration, the appreciation of the necessity or value of the continuity of manufacture from the ore to the finished product.

"And there was such a tendency, and though it cannot be asserted it had become a necessity, it had certainly become a facility of industrial progress. There was, therefore, much to urge its

and give incentive to conduct that could accomplish it. From the nature and properties of the industry, the processes of production were something more than the stage and setting of the human activities.

"They determined to an extent those activities, furnished their motives, and gave test of their quality not, of course, that the activities could get any immunity from size, or resources, or energies, whether exerted in integrated plants or diversified ones. The contentions of the case, therefore, must be judged by the requirements of the law, not by accidental or adventitious circumstances.

"The government does not hesitate to present contraditions, though only one can be true, such being we were told in our schoolbooks the 'principle of contradiction?' In one, competitors (the independents) are represented as oppressed by the superior power of the corporation: in the other they are represented as ascending to opulence by imitating that power's prices which they could not do if at disadvantage from the other conditions of competition: and yet confederated actions are not asserted. If it were this suit would take on another cast. The competitors would cease to be the victims of the corporation and would become its accomplices. And there is no other alternative. The suggestion that lurks in the government's contention that the acceptance of the corporation's prices is the submission of importance to irrestible power is in view of the testimony of the competitors, untenable. They, as we have seen, deny restraint in any measure or illegal influence of any kind. The government, therefore, is reduced to the assertion that the size of the corporation, the power it may have, not the exertion of the power is an abhorrence to the law, or as the government says, 'the combination embodied in the corporation unduly restrains competition by its necessary effect, and therefore is unlawful regardless of purpose' 'a wrongful purpose' the government adds, is 'matter of aggravation.' The illegality is statical, the purpose of movement of any kind only its emphasis. To assent to that, to what extremes would we be led? Competition consists of business activities and ability—they make its life: but there may be fatalities in it. Are the activities to be encouraged when militant, and suppressed or regulated when triumphant because of the dominance attained? To such paternalism the government's contention, which regards power rather than its use the determining consideration, seems to conduct; certainly conducts we may say, for it is the inevitable logic of the government's contention that competition must not only be free, but that it must not be pressed to the ascendency of a competitor for in ascendency there is the menace of monopoly.

"We have pointed out that there are several of the government's contentions which are difficult to represent or measure, and, the one we are now considering, that is the power is 'unlawful regardless of purpose,' is another of them. It seems to us that it has for its ultimate principle and justification that strength in any producer or seller is a menace to the public interest and illegal because there is potency in it for mischief. The regression is extreme but short of it the government cannot stop. The fallacy it conveys is manifest.

"The corporation was formed in 1901; no act of aggression upon its competitors is charged against it; it confederated with them at times in offense against the law, but abandoned that before this suit was brought; and since 1911 no act in violation of law can be established against it except its existence be such an act. This is urged, as we have seen, and that the interest of the public is involved, and that such interest is paramount to corporation or competitors. Granted, though it is difficult to see how there can be restraint of trade when there is no restraint of competitors in the trade nor complaints by customers. How can it be worked out of the situation and through what proposition of law? Of course it calls for nothing other than a right application of the law and to repeat what we have said above, shall we declare the law to be that size is an offense even though it minds its own business because what it does is imitated? The corporation is undoubtedly of impressive size and it takes an effort of resolution not to be affected by it or to exaggerate its influence.

"But we must adhere to the law and the law does not make mere size an offense or the existence of unexperted power an offense. It, we repeat, requires overt acts and trusts to its prohibition of them and its power to repress or punish them. It does not compel competition nor require all that is possible.

"Admitting, however, that there is pertinent strength in the propositions of the government, and in connection with them, we recall the distinction we made in the Standard Oil case between acts done in violation of the statute and a condition brought about which 'in and of itself, is not only a continued attempt to monopolize, but also a monopolization.' In such a case, we declared, 'The duty to enforce the statute' required 'the application of broader and more controlling' remedies than the other. And the remedies applied conformed to the declaration. There was prohibition of future acts and there was dissolution of 'the combination found to exist in violation of the statute' in order to 'neutralize the extension and continually operating force which the possession of the power unlawfully obtained' had 'brought' and would 'continue to bring about.'

"Are the case and its precepts applicable here? The Steel corporation by its formation united under one control competing companies and thus, it is urged, a condition was brought about in violation of the statute, and therefore illegal and became a 'continually operating force' with the 'possession of power unlawfully obtained.'

"But there are countervailing considerations. We have seen whatever there was of wrong intent could not be executed, whatever there was of evil effect, was discontinued before this suit was brought and this, we think, determines the decree. We say this in full realization of the requirements of the law. It is clear in its denunciation of monopolies and equally clear in its direction that the courts of the nation shall prevent and restrain the (its language is 'to prevent and restrain violations of' the act) but the command is necessarily submissive to the conditions which may exist and the usual powers of a court of equity to adapt its remedies to those conditions. In other words, it is not expected to enforce abstractions and do injury thereby, it may be, to the purpose of the law.

"It is this flexibility of discretion—indeed essential function—that makes its value in our jurisprudence—value in this case is in others. We do not mean to say that the law is not its own measure and that it can be disregarded, but only that the appropriate relief in each instance is remitted to a court of equity to determine, not, and let us be explicit in this, to advance a policy contrary to that of the law, but in submission to the law and its policy, and in execution of both, and it is certainly a matter for consideration that there was no legal

History of Suit

THE government dissolution proceedings against the Steel corporation was begun at Trenton, N. J., on Oct. 26, 1911, in a bill in equity filed in the United States circuit court there. It was alleged the Steel corporation is a combination in restraint of trade forbidden by the Sherman antitrust law. Thirty-seven companies, mostly subsidiaries of the Steel corporation, five persons as trustees, and 18 others as officers and directors were named as defendants.

Presentation of evidence was begun at New York on May 6, 1912, before Henry P. Brown, of Philadelphia, sitting as a special examiner and was continued in Pittsburgh and Washington. The hearings extended over the period of more than one year.

On June 3, 1915, the decision of the United States district court for New Jersey was that the government was not entitled to a decree, but jurisdiction was retained to enable the government to reply to the court in case hereafter there should be repetition of "certain agreements to fix prices."

All of the judges—Joseph Buffington, J. B. McPherson, Victor B. Woolley and William H. Hunt—concurred in the decision but the last two filed an opinion differing as to the various phases of the case.

Petition for the appeal was filed by the government at Trenton Oct. 28, 1915. On May 22, 1917, Justice White of the United States Supreme Court at Washington announced that the court had ordered reargument of the case, by briefs and this procedure subsequently was carried out.

attack on the corporation until 1911, 10 years after its formation and the commencement of its career. We do not, however, speak of the delay simply as to its time or that there is estopped in it because of its time, but on account of what was done during that time—the many millions of dollars spent, the development made, and the enterprises undertaken, the investments by the public that have been invited and are not to be ignored. And what of the foreign trade that has been developed and exists? The government, with some inconsistency, it seems to us, would remove this from the decree of dissolution. Indeed, it is pointed out that under congressional legislation in the Webb act the foreign trade of the corporation is reserved to it. And further, it is said, that the corporation has constructed a company called The Products Company which can be 'very easily preserved as a medium through which the steel business might reach the balance of the world,' and that in the decree of 'dissolution that could be provided.' This is supplemented by the suggestion that not only the Steel corporation, 'but other steelmakers of the country, could function through an instrumentality created under the Webb act.'

"The propostions and suggestions do not commend themselves. We do not see how the Steel corporation can be such a beneficial instrumentality in the trade of the world and its beneficence preserved, and yet be such an evil instrumentality in the trade of the United States that it must be destroyed. And by whom and how shall all the adjustments of preservation or destruction be made? How can the corporation be sustained and its power of control over its subsidiary companies be retained and exercised in the foreign trade and given up in the domestic trade? The government presents no solution of the problem. Counsel realize the difficulty and seem to think that its solution or its evasion is in the suggestion that the Steel corporation and 'other steelmakers could function through and instrumentality created under the Webb act.' But we are confronted with the necessity of immediate judical action under existing laws, not action under laws that have not been and may not be enacted. We must now decide and we see no guide to decision in the propositions of the government.

"The government, however, tentatively presents a proposition which has some tangibility. It submits that certain of the subsidiary companies are so mechanically equipped and so officially directed as to be released and remitted to independent action and individual interests and the competitor to which such interests prompt, without any disturbance to business. The companies are enumerated.

"But let us see what guide to a procedure of dissolution of the corporation and the dispersion as well of its subsidiary companies, for they are asserted to be illegal combinations, is prayed. The fact must not be overlooked or underestimated. The prayer of the government calls for not only a disruption of present conditions but the restoration of the conditions of 20 years ago, if not literally, substantially. Is there guidance to this in this Standard Oil case and the Tobacco case? As an element in determining the answer we shall have to compare the cases with that at bar, but this can only be done in a general way. And the law necessarily must be kept in mind. No other comment of it is necessary. It has received so much exposition that it and all its prescribes and proscribes should be considered as a consciously directing presence.

"The Standard Oil Co. had its origin in 1882 and through successive forms of combinations and agencies it progressed in illegal power to the day of the decree, even attempting to circumvent by one of its forms the decision of a court against it. And its methods in using its power was of the kind that Judge Woolley described as 'brutal' and of which practices he said, the Steel corporation was absolutely guiltless. We have enumerated them and this reference to them is enough.

"The Tobacco company case has the same bad distinctions as the Standard Oil Co. case.

"In the Tobacco case, therefore, as in the Standard Oil case, the court had to deal with a persistent and systematic lawbreaker masquerading under legal forms, and which not only had to be stripped of its disguises but arrested in its illegality. A decree of dissolution was the manifest instrumentality and inevitable. We think it would be a work of sheer supererogation to point out that a decree in that case or in the Standard Oil cases furnishes no example for a decree in this.

"In conclusion we are unable to see that the public interests will be served by yielding to the contention of the government respecting the dissolution of the company or the separation from it of some of its subsidiaries; and we do see in a contrary conclusion a risk of injury to the public interest including a material disturbance of, and, it may be serious detriment to, the foreign trade and in submission to the policy of the law and its fortifying prohibitions the public interest is of paramount regard. We think, therefore, that the decree of the district court should be affirmed."

Minority Holds Sherman Law Violated

THIS record seems to me to leave no fair room for a doubt that the defendants, the United States Steel Corp. and the several subsidiary corporations which make up that organization, were formed in violation of the Sherman act," says Justice Day in framing the minority opinion. "I am unable to accept the conclusion which directs a dismissal of the bill instead of following the well-settled practice, sanctioned by previous decisions of this court, requiring the dissolution of combinations made in direct violation of the law.

"It appears to be thoroughly established that the formation of the corporations, hereunder consideration, constituted combinations between competitors, in violation of law, and intended to remove competition and to directly restrain trade. I agree with the conclusion of Judges Woolley and Hunt, expressed in the court below—that the combinations were not submissions to business conditions but were designed to control them for illegal purposes, regardless of other consequences, and "were made upon a scale that was huge and in a manner that was wild" and "properties were assembled and combined with less regard to their importance as integral parts of an integrated whole than to the advantages expected from the elimination of the competition which theretofore existed between them. Those judges found that the constituent companies of the United States Steel Corp, nine in number, were themselves combinations of steel manufacturers, and the effect of the organization of these combinations was to give a control over the industry at least equal to that theretofore possessed by the constituent companies and their subsidiaries.

"The contention must be rejected that the combination was an inevitable evolution of industrial tendencies compelling union of endeavor.

"For many years, as the record discloses, this unlawful organization exerted its power to control and maintain prices by pools, associations, trade meetings, and as the result of discussion and agreements at the so-called 'Gary dinners' where the assembled trade opponents secured co-operation and joint action through the machinery of special committees of competing concerns and by prudent provision took into account the possibility of defection, and the means of controlling and perpetuating that industrial harmony which arose from the control and maintenance of prices.

"It inevitably follows that the corporation violated the law in its formation and by its immediate practices. The power, thus obtained from the combination of resources almost unlimited in the aggregation of competing organizations, had within its control the domination of the trade, and the ability to fix prices and restrain the free flow of commerce upon a scale heretofore unaproached in the history of corporation organization in this country.

"The facts established, as it seems to me they are by the record, it follows that if the Sherman act is to be given efficacy, there must be a decree undoing so far as is possible that which has been achieved in open, notorious and continued violation of the provisions.

"I agree that this offers no objection to the mere size of a corporation, nor to the continued exertion of its lawful

(*Concluded on page* 696)

Welsh Steelworkers on Strike

Fifteen Thousand Quit with Demand for 40 Per Cent Increase in Wages, Forcing 45,000 Others out of Work—Lack of Coke Forces Furnaces to Bank —Many Sheet and Rerolling Mills and Forges Suspend

The Iron Trade Review Staff Cable

European Headquarters,
THE IRON TRADE REVIEW,
16 Regent St., S. W. 1.

Serling—$3.44¼

LONDON, March 2.—Fifteen thousand Welsh steelworkers have gone out on strike, forcing 25,000 other workmen out of employment. The men are striking for an advance of 40 per cent in wages, and have refused to submit their grievances to arbitration.

The famine in semifinished steel has become more serious. Orders for iron and steel now are generally refused. Many steel rerolling mills have been forced to suspend operations for the lack of billets. Derbyshire pig iron has been advanced 2 shillings 6 pence (43 cents- to £10 5s ($35.41). Numerous furnaces have been slowing down, and two on the west coast have been banked because of the lack of coke. Many Staffordshire forges are operating but half the time for want of coal.

Owing to high ocean freight rates, imported iron ores are costing 70 shillings ($12.05), delivered Middlesborough.

Mild steel billets are now selling at £23 10s ($80.90) and Scotch steel bars have been advanced £2 ($6.89- to £28 10s ($98.11). Foreign buyers are offering large premiums for materials.

Sheet bars have been sold as high as £31 ($106.72). Half the sheet mills of the country are idle for the want of steel. In Staffordshire many of the heavy steel forges also are idle, due to a lack of orders.

British Market Is Greatly Inflated

European Staff Correspondence

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$3.42

BIRMINGHAM, Eng., Feb. 13.—The British iron and steel trade is more inflated than at any time during or since the war. Developments in regard to prices this week are significant. The steel manufacturers a few days ago decided to advance finished steel 20 shillings ($3.42) per ton and semifinished £2 ($6.84). It is almost impossible to get orders for finished steel accepted, while as to semifinished, although the nominal price of billets is £22 ($75.24) no contracts can be placed on this basis and £24 ($82.08) more generally is being obtained. A common quotation for sheet bars on the Birmingham exchange was £29 10s ($100.89). In South Wales tin bars are reported to have advanced £5 ($16.10) in a week to £30 ($102.60) per ton. In 1894 tin bars could be bought at £3 15s per ton, and during the war government control kept them at £10 to £12 10s.

The demand for steel is enormous, partly on account of the reduced output at all the works. Many of the rerolling works still are on short time. A few fortunate buyers of American billets received some of them this week on old contracts at £18 ($61.20) c.i.f., while there are still some to be delivered at £15 ($51).

Current British Prices

Domestic and Export. Gross Tons at Works

	£ s d	$
SEMIFINISHED STEEL		
Billets, soft steel	23.10.0	80.90
Sheet bars	25. 0.0	86.06
FINISHED STEEL		
Steel bars, England, ¾ to 3 inch	28.10.0	98.11
Ship plates, England	23.10.0	80.90
Ship plates, Scotland	23.10.0	80.90
Beams, England	19.10.0	67.13
Beams, Scotland	20.10.0	70.57
Sheets, black, 24 gage	40. 0.0	137.70
Sheets, galvanized, 24 gage	53. 0.0	182.45
Rails, 60 lbs. and over	19.15.0	67.99
Tin plate, base box, 108 lbs.	3.11.0	12.22
PIG IRON*		
Hematite, East Coast Mixed Numbers	11. 0.0	37.87
Hematite, Scotch	10.10.0	36.15
Middlesborough Basic	9. 5.0	31.84
Middlesborough No. 3	9. 0.0	30.98
No. 3 Foundry, Derby, Leicester, Nottingham	10. 5.0	35.29
No. 3 Foundry, Northamptonshire	9.12.6	33.13
No. 3 Foundry, Staffordshire	10.12.6	36.57
Scotch Foundry	11.10.0	39.59
Ferromanganese, 80 per cent.	30. 0.0	103.28

*Pig iron quotations are f.o.b. furnace for delivery in the United Kingdom. For export to Belgium, France and Italy, prices are 5 shillings per ton higher, except on hematite which is 10 shillings higher; other export quotations are subject to free negotiation.

COKE		
Yorkshire furnace	2.13.6	9.21
Yorkshire foundry	3. 6.0	11.36

Wire rods, which a short time ago could be bought for £18 ($61.20), now cost £25 ($80.50).

Large tonnages of American wire rods came into this country last summer. With the adverse rate of exchange, however, American rods now would cost at least £32 ($109.44) at port. Even if America were prepared to supply them this is not a competitive price. No reliance is now placed on American steel in view of the great home demand known to exist in the United States.

Sellers of sheets and sheet bars claim to be able to obtain whatever prices they care to quote, so anxious are buyers to get this material. Black sheets are selling up to £40 ($136.80) per ton, and unusually high prices are named for galvanized sheets. The quotation in Birmingham on Thursday was £53 ($181.26) per ton, a rise of £2 ($6.84) in the past week, while at Swansea the quotation was about £50 ($161). In the north of England as much as £55 ($177.10) is reported to have been paid by purchasers eager to obtain early delivery.

Less than a month ago the makers of finished iron in South Staffordshire revised their prices, but they now claim that the prices are insufficient, especially as wages have been advanced 5 per cent. Some manufacturers consider they lose money in having to buy puddled bars at £20

($68.40) and sell at £24 10s ($83.79). The matter, however, was carefully considered at a meeting during the course of yesterday's market, and the trade unanimously decided not to alter prices at present. The mills are swamped with orders, and are turning down a great deal of desirable foreign business.

The ironmasters have already decided that the only remedy of any value in the present situation is to increase output. At present the mills and forges work two 8-hour shifts in the 24, the plant remaining idle and the furnaces burning fuel uselessly for the remaining eight hours. There is a great desire to start a third shift, and secure continuous production. Several works have done this.

It is generally believed that Cleveland pig iron will be advanced, and as a first step basic iron was increased in price this week 5 shillings (85 cents) per ton, making the new selling figure £9 5s ($31.63). In other districts, however, sellers are disposed to retain the present prices as a nominal basis for business.

A Birmingham merchant this week, had an order to place for 50 tons of pig iron for the continent, but he was unable to get it accepted. As a last resort he tried to place five tons but was no more successful. However, it is reported from Cleveland that 200 tons of iron have been shipped to Germany this week, the first consignment since the outbreak of war in 1914.

Substantial premiums are being paid by foreign buyers in accordance with the recent rule which restricts prices for exports solely to France, Belgium and Italy.

Very high prices are reported from South Wales for tin plate, the latest being 71 shillings ($12.14) per box, Welsh makers are not assured of immunity from American competition, and they would like to arrest any further upward movement.

Raise Belgian Prices; Iron off Market

European Staff Correspondence

Value of Franc—$0.0666

BRUSSELS, Feb. 11.—Belgium's difficulties in production and distribution of iron and steel are continuing only in a lesser degree than is France.

Belgian pig iron is no longer to be found in the open market. Foundry iron is quoted at 625 francs ($41.62) a metric ton, f.o.b. Blooms are at 700 francs ($46.62), and slabs and ingots at 800 to 900 francs ($53.28 to $59.94). Merchant iron is selling at 97 francs, 50 centimes ($9.79) per 100 kilos (220 pounds) and is difficult to obtain. Open-hearth steel has reached 160 francs ($10.65) per 100 kilos.

The upward flight of dollar exchange, above 15 Belgian francs, has had no effect as yet on local prices, the latter being governed by other conditions, but it has effectually stopped the taking up of American stocks which have entered the country, wherever delay in waiting for more favorable rates could be supported. At that the Belgian franc is at a premium of nearly 5 per cent as compared with that of France, which gives Belgium this further benefit when it comes to paying for French iron ore brought across the border. As Belgium pays for this in coal and coke she takes a manufacturing profit as well. This explains why Belgium is still the most favored as to production costs.

Belgian metallurgical coke is selling at 135 to 140 francs ($8.99 to $9.32) a metric ton, f.o.b. ovens, which is from 10 to 20 francs ($0.66 to $1.32) cheaper than it is obtainable in France.

Belgian coal miners have gone back to the pits at least pending final wage adjustments. Mining costs have increased to a great extent, and no decrease in iron and steel values can be looked for until coal can be produced more economically, which means the adoption of more machinery. Daily production per man hovers around 450 tons. The amount in 1919 ranged from 413 tons in February to 458 tons in November.

Coal production now costs 51 francs ($3.39) a ton, as compared with 17 francs, 50 centimes ($1.16) in 1913, but if wages are raised to the level of those of France the cost would be increased to 80 francs ($5.32) were not the Belgian miner a greater producer than the French workman.

The Liege province, where so many of the great Belgian metallurgical industries are located, has more than 80 per cent of its labor employed. In this district Ougrée-Marihaye has just put another battery of coke ovens in operation, and a third furnace is awaiting the arrival of iron ore from France to be fired. The company also is operating three open-hearth furnaces, a converter, a rail mill and a wire mill and a plate mill. Cockerill's has just received a government payment on account of war damages amounting to 120,000,000 francs ($7,992,000).

Coal Famine Paralyzes French Works

European Staff Correspondence

Value of Franc—$0.069

PARIS, Feb. 11.—The coal shortage became more pronounced in the past week. Industrial Paris has been attempting to run on a coal supply of but 33 per cent of that required and with relative results. Probably the same is true in regard to the rest of the country, and certainly so in the big manufacturing centers. The basic industries feel the stringency most.

The fact that prices are stable at present signifies little in view of the inadequate transportation facilities. What stocks there are on hand are awaiting for delivery. The situation is practically in a state of deadlock.

Longwy pig iron containing 3 per cent silicon increased in price to 400 francs ($27.60) a metric ton, which is 15 francs ($1.03) more than the rise forecast early in January. For the moment, it appears to be stabilized, as does hematite pig iron at 540 francs ($37.26) which price represents an increase of 100 francs ($6.90) since Jan. 1.

The lack of transportation was the chief factor in these increases. The

railway situation has "improved" to the extent that the trainmen have decided not to strike. The dark cloud now is the French miners' strike threat.

Lorraine is in as critical a plight as at any time since the armistice, and the Metz-Thionville region is forced to employ 6000 German iron and steel workers in order to keep up even its limited operations. Knutange has banked its blast furnaces, and but two out of five furnaces at Fontoy are in operation, production being but 400 tons of pig iron per day as compared with a possible 2000. The de Wendel plants at Hayange and Moyeurse, having their own coal mines at Forbach, nearby, and their own cars, and consequently are in a more satisfactory state of production than many of their competitors.

Tin plate mills in France are congested with orders and deliveries are slow. Base prices count for little whenever supplies can be found in a middleman's hands.

Old metal prices are constantly increasing, owing to a shortage of pig iron. Scrap iron last week sold as high as 20 to 25 francs ($1.38 to $1.72) per 100 kilos (220 pounds), and boiler plate at 22 to 24 francs ($1.51 to $1.65). Plate shearings were quoted only at 11 to 12 francs (76 to 83 cents).

The dollar hovering around 15 francs, and pound sterling around 50 has absolutely precluded the possibility of placing American or English orders for delivery at these high rates of exchange.

Equipping Steel Plant

When present plans of the Electric Steel & Forge Co., Cleveland, are complete, its equipment will comprise two 6-ton and one ½-ton electric furnaces; two 2500, two 1500-pound and one 12,000, one 800 and one 600-pound steam hammers; 8, 12 and 16-inch rolling mills, together with heat treating furnaces, complete machine shop, etc. This company recently was organized with a capital of $2,000,000 to take over the business of the Crucible Steel Forge Co. In addition to making tool steels and special alloy steels, the Electric Steel & Forge Co. will specialize in alloy piston rods and die blocks, developed by the original company, which has conducted a general machine forging business in Cleveland for the past 15 years. Officers of the new company follow: President, J. H. Foster, president of the Hydraulic Pressed Steel Co.; vice president and general manager, D. W. Wells; secretary, C. R. Cross; treasurer, A. B. Smythe; purchasing agent, R. V. Coburn; sales manager, I. R. Watts, and general superintendent, C. A. Swan.

Material Handlers

Review Accomplishments and Lay Plans for the Promising Future

That the movement in this country toward the widespread adoption of physical labor saving devices now is well under way was clearly set forth at the first annual meeting of the Material Handling Machinery Manufacturers association at the Waldorf-Astoria hotel, New York, Feb. 26 and 27. Particular progress was shown in port and terminal development, and, according to conservative estimates, outside of the important installations made within the past year especially at southern and western ports, over $200,000,000 worth of terminal work is likely to go ahead within the next three years.

B. F. Fitch, president of the Motor Terminals Co., New York and Cleveland, spoke on "Motorizing Terminals." He confined his remarks principally to a description of the work that had been done in this respect at Cincinnati, where motor trucks by their adoption and scientific operation had solved many of the important problems of freight handling at railroad terminals. Briefly, the installation, he asserted, consisted of overhead rails, electric cranes, electric hoists, motor trucks and a plurality of interchangeable motor truck bodies.

In a paper on the "Advantages of Association Work and Methods of Attacking Large Problems by Joint Action," Henry W. Standart, secretary-treasurer of the Northern Engineering Works, Detroit, suggested a valuable method to be used might come about through a careful study and development of the industry with a view to coordinating into group operation the units of the various types of machinery manufactured by the member companies. A. R. Ulrich, sales engineer of the Edward F. Terry Mfg. Co., New York City, emphasized the importance of the equipment buyer knowing all about the various types of machinery.

The newly elected board of governors follows:

Cranes, hoists and winches: F. W. Hall, Sprague Electric Works, New York; Henry W. Standart, Northern Engineering Works, Detroit. Gravity and power conveyors: J. C. Walter, Alvey Ferguson Co., New York; W. F. Merrill, the Lamson Co., Boston. Elevators: R. W. Scott, Otis Elevator Co., New York; D. V. Jenkins, Watson Elevator Co., New York. Industrial trucks: L. C. Brown, Elwell Parker Electric Co., New York; Roy Owens, Lakewood Engineering Co., Cleveland. Bulk handling machinery: Fred Stadelman, Wellman-Seaver-Morgan Co., New York; T. Robins, Robins Conveyor Belt Co., New York. Miscellaneous equipment: G. O. Helmstaedter, Hyatt Roller Bearing Co., New York; C. W. Miller, Jeffrey Manufacturing Co., Columbus.

Association officers will be elected by the new board at its March meeting. A resolution was adopted urging congress to appropriate $1,900,000 for the bureau of foreign and domestic commerce.

Minority Decision

(*Concluded from page 693*)

power, when that size and power have been obtained by lawful means and developed by natural growth, although its resources, capital and strength may give to such corporation a dominating place in the business and industry with which it is concerned. It is entitled to maintain its size and the power that legitimately goes with it, provided no law has been transgressed in obtaining it.

"But I understand the reiterated decisions of this court construing the Sherman act to hold that this power may not legally be derived from conspiracies, combinations or contracts in restraint of trade. To permit this would be to practically annul the Sherman law by judicial decree.

"As I understand the conclusions of the court, affirming the decree directing dismissal of the bill, they amount to this: That these combinations both the holding company and the subsidiaries which comprise it, although organized in plain violation and bold defiance of the provisions of the act, nevertheless are immune from a decree effectually ending the combinations and putting it out of their power to attain the unlawful purposes sought, because of some reasons of public policy requiring such conclusion. I know of no public policy that sanctions a violation of the law, nor of any inconvenience to trade, domestic or foreign, which should have the effect of placing combinations, which have been able to thus organize one of the greatest industries of the country in defiance of the law forbidding such combinations.

"It is said that a complete monopolization of the steel business was never attained by the offending combinations. To insist upon such result would be beyond the requirements of the statute and in most cases practically impossible. It is affirmed that to grant the government prayer for a decree of dissolution would not result in a change in the conditions of the steel trade. Such is not the theory of the Sherman act. That act was framed in the belief that attempted or accomplished monopolization, or combination which suppress free competition were hurtful to the public interest and that a restoration of competitive conditions would benefit the public.

"In that case the subject of reconstruction so as to restore such conditions was elaborated upon and carefully considered. In my judgment the principles there laid down if followed none would make a very material difference in the steel industry. Instead of one dominating corporation, with scattered competitors, there would be competitive conditions throughout the whole trade which would carry into effect the policy of the law."

Controlling Production and Keeping Costs in a Broaching Tool Plant

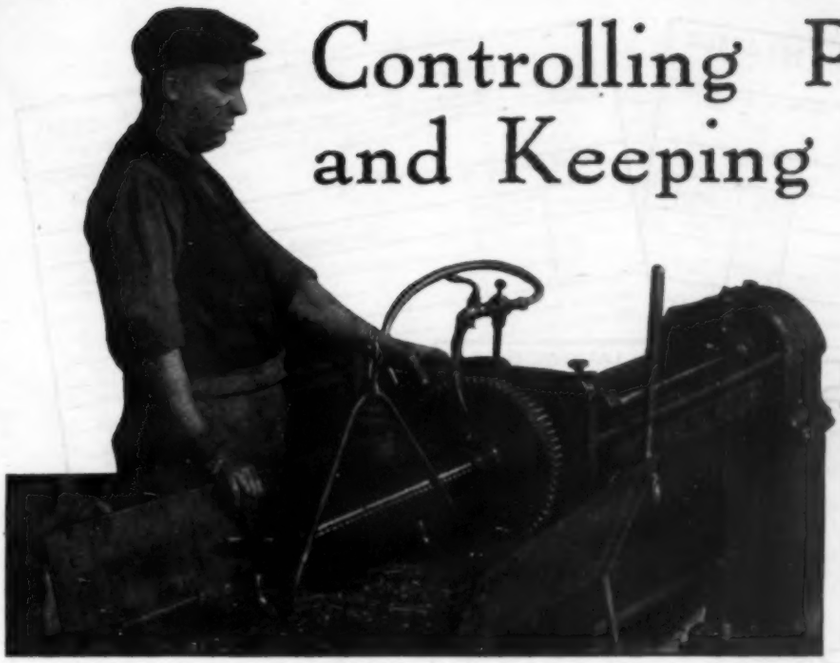


FIG. 1—CUTTING SIX KEYWAYS IN STEEL GEAR BY BROACHING PROCESS

Upon Receipt of Order, Work Is Planned and Schedule Is Adopted — The System of Records Enables Executives to Know at a Glance Status of Job in Relation to Schedule —Cost Keeping Is Simplified

BY H. R. SIMONDS

FEW industrial plants offer the difficulties of systematizing and cost keeping that are found in the manufacture of broaching tools. In the majority of cases these tools are made up according to individual drawings and specifications. Each new job presents a new problem and requires new methods and new operations for its production. Therefore, unusual interest attaches to the successful plan of routing and cost keeping recently adopted at the plant of J. N. Lapointe Co., New London, Conn.

Broaching has gained greatly in popularity during the last few years and therefore has necessitated increased production in the manufacture of broaching tools. The New London plant is a large, modern establishment where even before the present improved system of production was put into effect, a large number of broaching tools were turned out for use in the manufacture of machine parts throughout the United States. The new routing system, while simple in operation, necessarily involved some complications in being established in a plant already in operation. Perhaps the system can be more readily understood if some idea of the operation is given first.

Broaching tools are made for a great variety of work and one completed machine part may require from one to as many as six or eight broaches to produce the desired result. In Fig. 1 the 6-spined broach shown is used to simultaneously cut six key ways in large steel gears. Fig. 6 gives an excellent idea of a simple broaching operation. The collar which is to be broached is made out of a forging and the object of the operation is to give accurately formed curved surfaces as shown in the specimen which is tipped up on the table. The broach as it is pulled through completes the internal finish of the forging at one operation. The chips which are cut from the forge by the successive teeth of the broaching tool are readily seen in the illustration. Fig. 17 shows a method of machining the bearing surfaces on the exterior of a small adjustable seat journal used in a shaft hanger. In this case two broaching tools are used at the same time to finish both sides of two of the journals at once. Fig. 9 serves to give some idea of the variety which is met with in the manufacture of broaching tools. The operation shown is that of completely and accurately finishing the strap end of a connecting rod. It is common in broaching specifications to require an accuracy within the limits of plus or minus 0.0005 of an inch.

New tools are constantly being designed for broaching parts which heretofore have been machined on other machine tools, and therefore an important part of the manufacture of broaching tools is the engineering department, which must not only determine which parts can be successfully broached, but must also design the tool, determine the method, indicate the number of broaches to be used, and show in detail how they are to be made.

To follow the history of a broaching tool through the J. N. Lapointe Co. plant from the receipt of an inquiry to the delivery of the finished product will serve to convey a general idea of the manufacture of broaching tools and will also afford a means of studying

The J. N. Lapointe Company

FACTORY ORDER

Agent's No. _____ Shop Order No. _____

Agent _____ Customer's Order No. _____

Drawing No. _____ Date Customer's Order _____

Date _____

Customer _____ Address _____

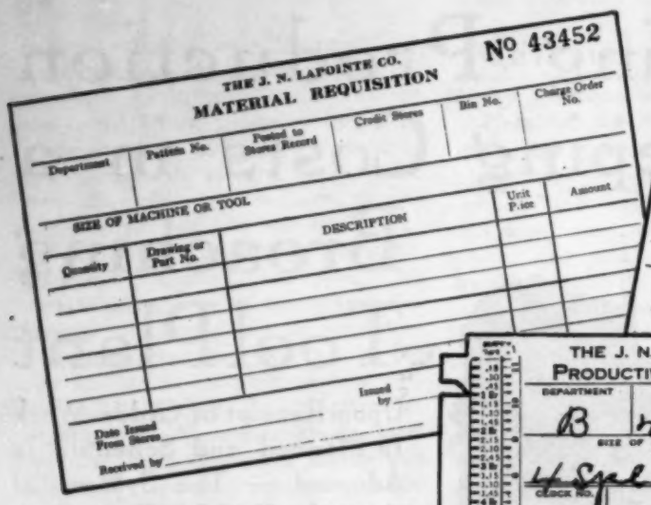
ITEMS	DESCRIPTION OF WORK TO BE DONE
A	
B	

Date Ordered _____

Date Promised _____ Ordered by _____

Date Completed _____ Approved by _____

FIG. 2—FACTORY ORDER FORM USED FOR EACH TOOL PASSING THROUGH PLANT


THE J. N. LAPOINTE CO.
MATERIAL REQUISITION
No 43452

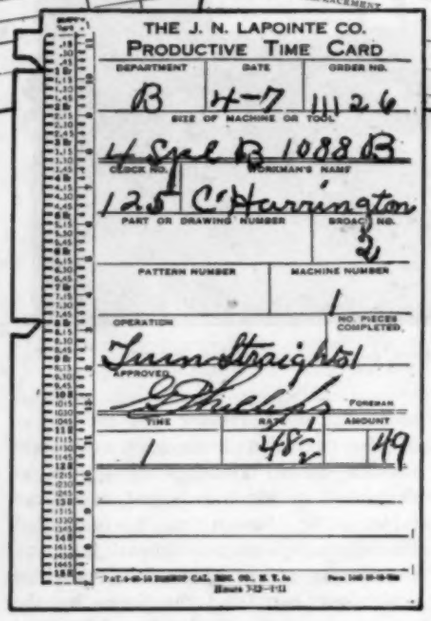
Department | Pattern No. | Posted to Stores Record | Credit Stores | Bin No. | Charge Order No.

SIZE OF MACHINE OR TOOL

Quantity	Drawing or Part No.	DESCRIPTION	Unit Price	Amount

Issued by
Date Issued From Stores
Received by

FIG. 3—REQUISITION FORM FOR MATERIAL

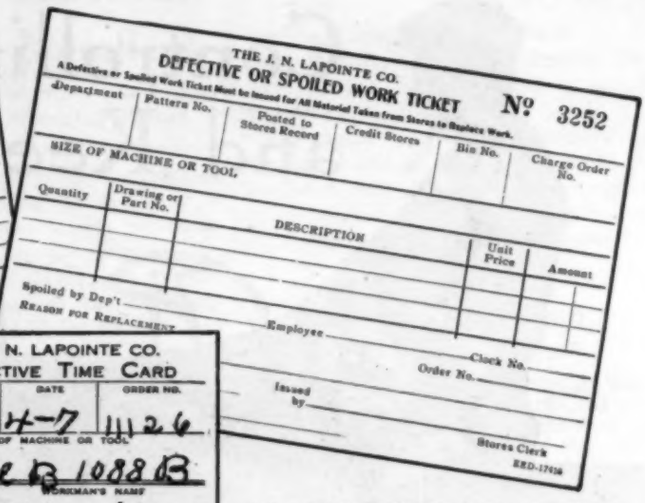

THE J. N. LAPOINTE CO.
PRODUCTIVE TIME CARD

DEPARTMENT	DATE	ORDER NO.
B	4-7	11126

SIZE OF MACHINE OR TOOL
4 Spl B 1088 B
CLOCK NO. | WORKMAN'S NAME
125 C. Harrington
PART OR DRAWING NUMBER | BROACH NO.
2
PATTERN NUMBER | MACHINE NUMBER
1
OPERATION | NO. PIECES COMPLETED
Turn Straight
APPROVED | FOREMAN
D. Phillips

TIME	RATE	AMOUNT
1	48½	49

FIG. 4—PRODUCTIVE TIME CARD


THE J. N. LAPOINTE CO.
DEFECTIVE OR SPOILED WORK TICKET
No 3252
A Defective or Spoiled Work Ticket Must be Issued for All Material Taken from Stores to Replace Work.

Department | Pattern No. | Posted to Stores Record | Credit Stores | Bin No. | Charge Order No.

SIZE OF MACHINE OR TOOL

Quantity	Drawing or Part No.	DESCRIPTION	Unit Price	Amount

Spoiled by Dep't
Employee
Clock No.
Reason for Replacement
Order No.
Issued by
Stores Clerk
ERD-17618

FIG. 5—CARD USED FOR DEFECTIVE WORK

the routing system which recently has been installed. An inquiry is received, for example, concerning a collar containing two spiral rectangular grooves. The inquiry goes to the sales department where it is listed and where if the first information is insufficient, as is usually the case, a form letter is sent back asking for a blue print and for additional detail concerning the part in question. When sufficient information is at hand to permit an estimate, the inquiry together with all data is sent to the estimating department. This department, although separate from the engineering department as far as records and filing are concerned, must necessarily be in close touch with the engineers, for the design of the tool and the number of tools required naturally are important factors in determining the cost. When the estimate is completed, it is sent back to the sales department where it is entered on a 3 x 5-inch card and placed in a 1-to-31 index at a place corresponding with the date 10 days later. The inquiry, together with the estimate then becomes sales department property and is handled in the usual way with follow up letters until the order is secured or the matter is dropped. As soon as an order is secured, it is sent to the engineering department where a detail of the tool or tools is laid out. It sometimes is found advisable when actually receiving an order to use an extra operation in the broaching process, in which case an extra tool is necessary. When the drawings are completed they are sent to the order department together with any other data which may be required. If several tools are required on the job, each tool is given an order number. The order department at the same time that it gives the job an order number makes out, in five copies, a form called a factory order, shown in Fig. 2. The first of these five copies is filed in numerical sequence in the order department. The second goes to the cost department. The third to the engineering department, the fourth to the inspection department, and the fifth to the shipping department.

The cost department immediately makes out a requisition in duplicate for material from the steel storeroom. At the storeroom the requisition is filled, and one copy of the requisition, properly filled in is returned to the cost department. The second copy is kept on file in the storeroom.

The second copy of the factory order form is placed in an envelope together with the plans and all data pertaining to the job in question. This then passes on to a routing man who fills out a route form as shown in Fig. 10. At first appearance this form gives the impression of complicating rather than simplifying the manufacturing process. However, it is one of the most important features of the new plan and by its adoption alone production in the plant has been greatly increased. On this form the date promised for delivery is entered at the left and then the time of operation throughout the plant is proportioned and specified in detail so that the job will be completed at the date first noted; that is the promised

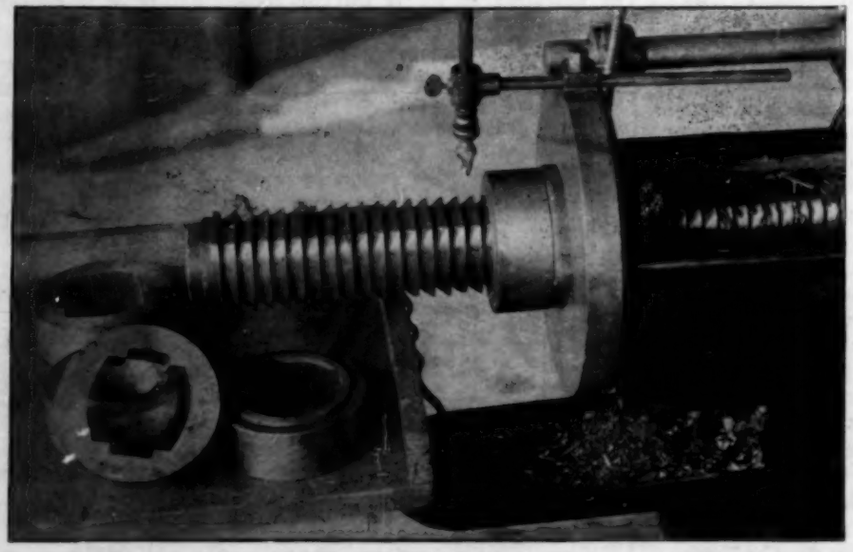


FIG. 6—INTERNALLY SURFACING FORGED COLLAR IN ONE BROACHING OPERATION

1. Wages of Superintendent and Foreman.
2. Wages of all other Non-productive Labor.
3. Departmental Expense Supplies.
4. Productive Supplies.
5. Insurance.
6. Taxes.
7. Depreciation.
8. Repairs to Machinery and Equipment.
9. Repairs and Replacement of Small Tools and Jigs.
10. Repairs and Replacement of Patterns.
11. Repairs to Buildings.
12. Defective Workmanship.
13. Defective Material.
14. Coal and other Fuel.
15. Gas, Electricity and Water Purchased.
16. Freight and Express, Inward (not charged direct to a job).
17. Lost Time due to stoppage of power or other causes.
18. Overtime, Bonus.
19. Work Spoiled due to natural causes.
20. Other Miscellaneous Expense not classified.

FIG. 7—CARD SHOWING EXPENSE ACCOUNTS

CARDS SIMILAR TO THE ONE REPRODUCED AT LEFT ARE POSTED THROUGHOUT SHOP FOR CONVENIENCE OF WORKMEN — EACH ENVELOPE CARRIES THE RECORDS FOR A SHOP ORDER AND ACCOMPANIES THE JOB.

FIG. 8—ENVELOPE FOR RECORDS FOLLOWING JOB

date or, in the absence of any promise, the date which the routing department sets as that which will give a fair working time throughout the plant.

It will be seen from this that considerable responsibility rests with the routing department. The men in this department must not only be familiar with all of the work which is being handled in the plant but they must know the average time required for each operation and also must be familiar with any alterations or delays occurring in any of the sections of the plant. Based upon the routing department form, a schedule card as shown in Fig. 15, is made out showing the progress of each job as it passes through the shop. This card carries the name of the customer, the description of the work, the order number, and a series of dates similar to those on the routing form showing where each tool should be on successive days. Small red and green markers are used to indicate whether a tool is falling behind the schedule or not. As shown in the illustration, these markers project above the top margin of the card and thus show in the file at a glance what proportion of the work is falling behind schedule. A red marker is used for work which is behind and a green marker for work which is up to date or ahead. A series of numbers from 1 to 31 at the left of the card are used to quickly indicate the promised date, and for this purpose a small brass clip with a hole in it is slipped over the card and placed so that the proper date shows through the hole.

After each operation every piece is inspected by a man from the inspection department. It is the duty of the inspectors to pass on the work for the succeeding operation and to note the time taken by the man carrying on the operation just completed. Each workman has a productive time card which he fills out with the date, the order number on which he is working, his name and nature of the operation. He then stamps the card at the time of starting work on the particular job in question at a time clock which indicates the hour. When the job is finished, or when he leaves the job to go on other work, he reverses the card and stamps it again in the time clock which then automatically indicates the elapsed time. Such a card is shown in Fig. 4. Posted prominently in the shops are cards similar to that reproduced in Fig. 7 showing a list of expense account numbers against which time or material may be charged. In case the power goes off and machinery is idle, each man affected punches out the card on which he has been working and punches in a new card with the number 17 on it, which number he gets from the list just mentioned and which reads "lost time due to stoppage of power or other causes."

In this way, the production of each tool is charged directly with only the amount of labor which has been put to useful purpose. This same general scheme is persistently carried out in all of the plant operations. For instance, if a piece of steel is rejected by an inspector, perhaps because between the third and fourth operations it was turned down to too small a diameter, then the piece is taken to the scrap room, a new piece is issued from stock

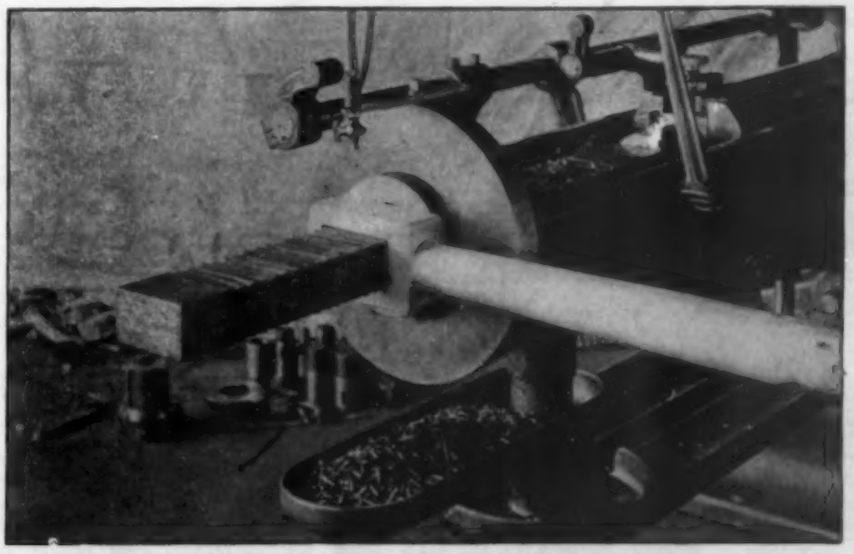


FIG. 9—LARGE BROACHING TOOL COMPLETELY FINISHING OPENING FOR BRASSES ON STRAP END OF CONNECTING ROD

ROUTING DEPARTMENT

Shop Order	Description	No.	Date Promised	Turning		Soft Ground		Planed		Milled		Teeth Cut		Threaded or Slotted		Filed		Hardened or Straightened		Finish Ground		Splines Ground		Stoned		Insp. Tested and Shipped	
				OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN

FIG. 10—THE FORM USED IN FIRST MAKING OUT A ROUTING SCHEDULE FOR EACH BROACHING TOOL

and the procedure is started over again. In such cases, the routing department attempts to reroute the work so as to catch up with the previously established schedule. It may be that the part which is rejected is only one part of many going to make up a certain job and in this case its operations are often pushed ahead of other incoming work in order to have it catch up with other pieces of the same job which are in progress through the plant.

The rejection of a piece of material is accompanied by numerous entries in the records of the company. A defective or spoiled-work ticket is made out in four copies, one of which goes to the accounting department, one to the works manager, one is used for drawing new material, and the fourth is filed in the inspection department. These tickets give all the information necessary to group and distribute the cost of spoiled work at the end of each month. The employe's name and the reason for the loss is also given. In case it is the fault of the employe the card is filed accordingly and becomes a record against the man which is used in determining discharge or promotion. At the end of each day the works manager knows from the number of defective or spoiled work tickets which he receives just what loss is occurring from this source. In the accounting department the spoiled work tickets play a definite role, for the correct cost of each tool is largely dependent upon how the loss due to defective or spoiled work is handled.

The material which is turned in to the scrap room if above a certain size is thrown in with a stock of material for reclaiming purposes. If below the size it is thrown into the scrap to be sold each month to scrap dealers. The material which is to be reclaimed is charged to a scrap account and all work which subsequently is done upon the material for the purpose of reclaiming it is also charged to this scrap account.

Material is Reclaimed

The reclaimed material is then turned into the stock room at the regular price for new material and this price is credited to the scrap account. In case a workman by mistake turns a 2-inch piece slightly under the required diameter and the piece is rejected, it then is placed with material for reclaiming and is charged to the scrap account at the price which it would bring for scrap, determined by its total weight. As work varies in the plant, and some machines are temporarily idle, the workmen draw material from this reclaiming stock and work it down to a size which will permit its being used as new stock. In the case of the bar just referred to, it is drawn out of the reclaiming stock and is turned down to a 1⅞-inch bar. The time required in turning it down is charged to the scrap account on a productive time card as explained above and as shown in Fig. 4. The 1⅞-inch bar is then turned in at the stock room where it is received the same as new material and a credit slip is made out crediting the stock account with the actual cost of the bar if it were purchased as new stock. For the purpose of making this credit a stock credit order is made out on a form somewhat similar to the defective or spoiled work ticket but omitting any reference to spoiled work.

This general scheme of reclaiming material has worked out satisfactorily in the plant's operation. The scrap account so called has really little to do with scrap and would more properly be called a reclaiming account. It shows from month to month a small loss. In other words, according to the methods of operation and of entering charges, it costs a little more to reclaim spoiled material than it would to scrap it, and buy new stock. However, the big advantage under the plan adopted is that the men are kept busy all of the time and in the manufacture of a product

Order No._____

Cost Posting Sheet—Shop Orders

DEPART.	MATERIAL DEP'T CHARGES		PROD. LABOR		PROD. LABOR		PROD. LABOR		PROD. LABOR	
	Weight	Amount	Hours	Amount	Hours	Amount	Hours	Amount	Hours	Amount

Form 9 M M P & Co.

THE J. N. LAPOINTE CO.

STOCK CREDIT

№ 1601

Department	Pattern No.	Posted to Stores Record	Charge Stores	Bin No	Credit Order No.

SIZE OF MACHINE OR TOOL

Quantity	Drawing or Part No.	DESCRIPTION	Unit Price	Amount

Date Delivered to Stores_____ Received by_____

Delivered by_____ Stores Clerk

CUSTOMER ADDRESS

S. O.	Order No.	Description	Amount	DATES Factory	Promised	Shipped

FED-1m-5

FIG. 11—STOCK CREDIT FORM USED IN RETURING MATERIAL TO THE STOCK ROOM. FIG. 12 (ABOVE)—COST POSTING SHEET FOR SHOP ORDERS. FIG. 13—CUSTOMER'S CARD; THESE ARE FILED ALPHABETICALLY

Order Register

Factory Order No.	Purchasers Order No.	PURCHASER	ADDRESS	DESCRIPTION	Date Entered	Date Shipped or Cancelled	Invoice No.	Broach & Tools	Fixtures	Broach Machines	Grinders	Repair Parts	Miscellaneous	Total		Agents	

FIG. 14—A SHEET FROM LEDGER WHERE ALL ORDER NUMBERS ARE LISTED CONSECUTIVELY

such as broaching tools where a fluctuation in work must necessarily exist this is an important item. The time which is charged to reclaiming bars would in most cases have to be charged as a loss and thus cause an increase in overhead if the work of reclaiming stock was not available.

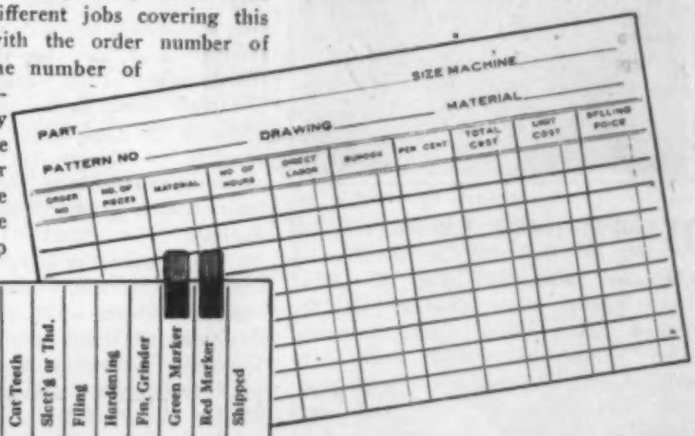
Summarize Costs

Every month a summary is made of the different accounts and reports are placed before the works manager and the general manager showing the totals under each item. Thus at a glance, it is possible for those in charge to see what the month's cost for spoiled work due to defective material has been; what portion has been due to carelessness, and what portion due to unpreventable causes. It is also possible to determine by the new system, not only the detailed cost of each tool, but the cost of each operation in connection with groups of tools, and also the proportionate costs for material and labor. So far, the records show a loss due to defective or spoiled work equal to 2 per cent of the total output. This 2 per cent has therefore been added by the estimating department as part of the regular cost of plant operation. At first, before this new system was put into effect, it was the custom to attempt to charge against each individual job the cost of work spoiled on that particular job. Thus for a complicated piece of work requiring small parts which easily warped during heat treatment an estimate would be made allowing for an average amount of loss. If a large spoilage occurred the particular job would show an actual dollars and cents loss on the company's books. The present system charges all work alike, with the evenly distributed cost of spoiled work, occurring throughout the plant.

On the back of the copy of the original factory order which is sent to the cost department, there are columns provided for keeping the total labor charge. This record becomes the detailed cost record against each individual shop order number. A column near the left provides a space for charges for material. This shows the weight and amount charged and is made up from the material requisition duplicates which are sent back from the stock room to the cost department. Other columns to the right of this provide room for the entry on the record of each productive time card turned in. Both material charges and the time cards are entered on this cost posting sheet every day so that if desired the cost of each job at the end of any day may be readily determined. The principal purpose of keeping such close costs is of course to enable the estimating department to give out accurate and consistent estimates. For this purpose, a series of records are made up on 3 x 5-inch cards showing the part, the size of machine, the pattern number, the drawing number and the kind of material. Then, listed below this, appear the different jobs covering this same part with the order number of each job, the number of hours required by each job, the direct labor charge, the overhead, the total shop cost and finally the selling price. From these cards it is possible to determine over a period of time the relation between the production cost on any particular part and the selling price, and in this way to provide for adjusting the selling prices either up or down to suit way to provide for adjusting the selling prices either up or down to suit the established cost of manufacture.

Customers' Cards Carefully Kept

Working in with this cost keeping system but wtih particular reference to service to customers, a cross reference card index is kept alphabetically arranged according to customers' names. This index carries the shop order numbers, and a brief description of each piece of work together with the amount quoted and the dates promised and shipped. These cards while a small detail of the system have, according to the manager, proved of value equal to many times the cost of keeping them up. It is common practive for a customer to wire or telephone in, asking about his job which is in progress, and before the customer card index was installed it was necessary, before answering, to turn through a great mass of shop order records until the customer's name was reached. Under the present system the customer's card is quickly found and presents at a glance all



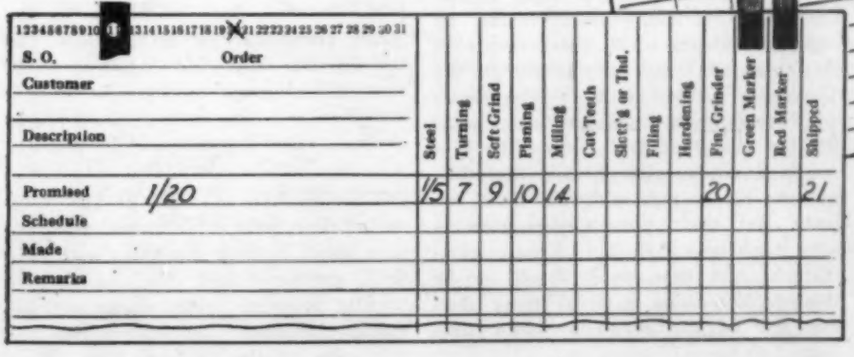


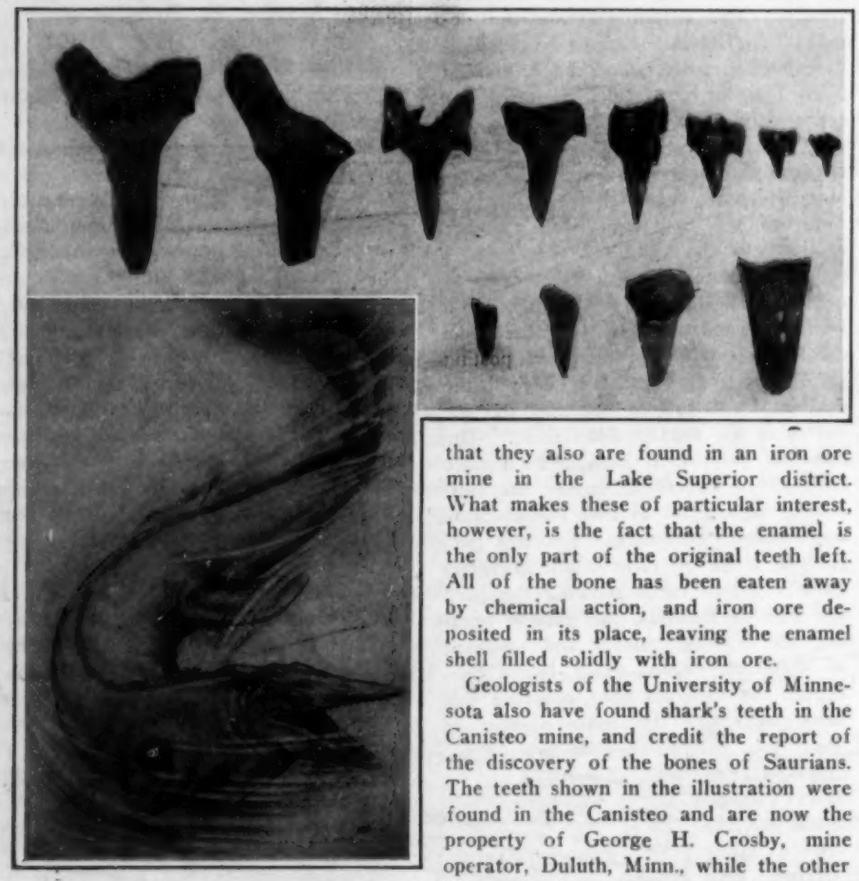
FIG. 15—PROGRESS RECORD CARD FROM WHICH AT A GLANCE IT IS POSSIBLE TO TELL WHETHER TOOL IS AHEAD OR BEHIND SCHEDULE. FIG. 16 (ABOVE)—CARD USED IN KEEPING COST RECORDS IN ESTIMATING DEPARTMENT

of the information necessary to answer the inquiry.

The Start is Difficult

To adopt any such system as this requires considerable tact upon the part of the management. Shop superintendents and foremen particularly are as a rule reluctant to see any changes in system or operation when it requires additional paper work. In the Lapointe plant it was necessary to accustom the workmen to make out productive time cards for each definite job on which they worked and this at first was met with considerable opposition. The system now, however, has been thoroughly tried out and has met the approval of every one from manager to the newest workman. Since its adoption an increase of 75 per cent has been made in meeting delivery dates and the production of the plant has also been largely increased.

Find Shark's Teeth Filled with Iron Ore in Mesabi Mine



BESIDES taking 1,255,668 tons of iron ore from the Canisteo mine at Coleraine, Minn., last year, the Oliver Iron Mining Co., subsidiary of the United States Steel Corp., extracted other things of special interest to mineralogists, although not of such practical importance to iron and steel makers. The word "extracted" is used advisedly, for with the ore many shark's teeth and the bones of Saurians, or marine reptiles, were removed.

The various publications of the United States geological survey have numerous accounts of such remains being found in the West, but it is not generally known that they also are found in an iron ore mine in the Lake Superior district. What makes these of particular interest, however, is the fact that the enamel is the only part of the original teeth left. All of the bone has been eaten away by chemical action, and iron ore deposited in its place, leaving the enamel shell filled solidly with iron ore.

Geologists of the University of Minnesota also have found shark's teeth in the Canisteo mine, and credit the report of the discovery of the bones of Saurians. The teeth shown in the illustration were found in the Canisteo and are now the property of George H. Crosby, mine operator, Duluth, Minn., while the other illustration is geology's conception of the Saurian.

"At Coleraine the iron-bearing formations are overlain, unconformably, by cretaceous shales which carry numerous marine fossils," says a geologist of the University of Minnesota. "The shales which carry these fossils are often nothing but a worked-over bed of the iron ore, and are so rich in iron that they go into the market with the main ore body, but their present deposition is very much later than that of the original material, and these fossils should not be used to determine anything more than the age of the shale in which they occur."

Costa Rica and Panama Produce Manganese

Manganese deposits have been known to exist in Panama for many years, and some were extensively worked as early as 1871. None were recorded in Costa Rica, however, until 1915, when American engineers found deposits in the western part of that country, and explored many of them. During 1916, 1917 and 1918, about 18,000 tons of ore was exported from Costa Rica to the United States. In October, 1918, the United States geological survey had the deposits examined.

The deposits are found on the Nicoyan peninsula, in the province of Guanacaste. Most of them lie within 16 miles of Playa Real, in the northern part of the peninsula. Other isolated deposits occur in the eastern part of the peninsula near the Gulf of Nicoya, and it is thought further exploration may bring others to light.

Although deposits of manganese oxides were examined at 36 places near Playa Real, most of the ore shipped was from three deposits that lie in an area scarcely 1000 feet square at Playa Real, which are owned by the Costa Rica Manganese & Mining Co., an American company. At Playa Real, as at many other places in the region, the manganese oxides form very irregular masses, which appear to extend along the crests of hills. The genesis of the deposits is obscure, but sufficient work has been done to show that only a few persist for as much as 100 feet below the surface. Estimates of the size of the known deposits indicate that they might yield 10,000 to 15,000 tons in addition to that already shipped. The oxides are intimately mixed with silica, so that careful sorting is necessary to produce material containing more than 45 per cent of manganese.

The deposits in Panama lie in an inaccessible region along the Boqueron river, about 20 miles northeast of Colon. They are about 12 miles southwest of the deposits at Nombre de Dios, which were extensively explored from 1871 to 1902. These deposits are poorly exposed and only a few of them have been explored, but indications in two small areas warrant an estimate that the deposits may yield 25,000 to 30,000 tons of high-grade oxides. As there is considerable float along the nearby streams, other deposits may be found.

The Washburn shops of the Worcester Polytechnic Institute manufacture small drilling machines and twist drill grinders and the business is rapidly growing. The shops are primarily intended for the practice and education of the students but a large

business could be built up if it were possible to get an adequate working force. Already the shops are sending machines abroad. At present three drill grinders are leaving for England, three for Belgium and three for India.

National Marine Week To be Observed

To arouse the American people to take a voting and investing interest in the American merchant marine and in this way establish the maritime independence of the United States, a series of demonstrations centering in New York, will be held the week of April 12-17, under the designation of National Marine Week. An elaborate program, which will include, parades, dinners, exhibits and an exposition of the largest collection of ship models ever gathered in America, is being arranged under the auspices of the National Marine League, which is fostering the movement. The ceremonies will be opened by Secretary of Commerce Joshua W. Alexander; Chairman John Barton Payne, of the shipping board; Senator Wesley L. Jones, chairman of the senate commerce committee; Hon. William S. Greene, chairman of the house merchant marine committee, and others prominent in national maritime affairs.

"The time has come," says a statement issued by the National Marine League, "for the nation to realize the pressing economic importance of national maritime independence. American cargoes, mails and passengers must be carried largely in ships built, owned, operated and manned by Americans and in ships equipped and repaired by American industries and classified and insured by American companies. It is a matter of the greatest importance to the inland as well as to the seaboard states, that the country's merchant marine be put upon a permanent basis of healthy development."

Explains Why Rails Were Not Sold to Roads

A recent report from the war department has issued an official statement concerning the sale last fall by the corps of engineers of 57,000 tons of 80-pound rails to the J. K. Joice Co., New York, in which it says that rails were previously offered to the railroads through the railroad administration and rejected by them as being of a type wholly unsuited for use. The statement continues:

"The standard type of rail section as adopted by the railroads of the United States is known as the American Society of Civil Engineers, or 'A. S. C. E.,' section and is so designed that the base is equal in width to the height of the rail. The ball of this rail is designed to be a certain proportion of the height.

"The 'A. R. A.' type B rail (which was sold) is a composite blend of the American Railway association's design and is entirely different in section from the standard 'A. S. C. E.' rail. Never having been adopted by the railroads of this country the 'A. R. A.' type B rail is unsuited for use upon America's standard railroads. Being of a special section it obviously requires special accessories in the way of splice bars, etc.

"At the time the sale was made to the J. K. Joice Co. it was considered a most advantageous one for the government, in that the accepted bid of $40 per ton, was $4 higher than any bid previously obtained. At that time the sale was considered an excellent one by the highest authorities in the iron and steel business."

Australian Metal Trades More Active

(Special Correspondence)

Newcastle, N. S. W., Jan. 30.—The engineering and metal trades in Australia are exceedingly active and a number of companies have increased their working forces. A report from the department of labor and industry states that there is every indication of an industrial revival on a large scale, with the promise of additional industries commencing operations in the near future. A large increase is shown and the number of men employed at the sulphide plant of the Newcastle Steel Works, a new mill having been put in operation. Much activity also is noted in the shipyards. A number of strikes have affected certain industries, particularly the Newcastle Steel Works. Operation of the Broken Hill Proprietary Co. also are seriously affected by a strike of iron ore miners which has been in progress for nearly nine months.

The year 1919 witnessed progress in all lines of industry in Newcastle. The Broken Hill company now employs 4200 men in this city. The manager of this company states that it expects to add men at the rate of 1000 per annum for the next 10 years. Its chief difficulty now is in getting iron ore and in shipping iron and steel to the various states. Transportation is still insufficient to requirements, and there are accommodations for only the most pressing demands.

The output of the two blast furnaces of the Newcastle Steel Works for four weeks ended Dec. 10 amounted to 22,545 tons. This company's open hearths produced 12,432 tons of steel, its rolling and finishing mills, 9070 tons and merchant mills, 8041 tons.

An advance in railway freight rates has caused the Lithgow Steel Works to close down, forcing several hundred men out of employment. This concern operated three blast furnaces.

The prime minister has announced that the trade and customs department has been empowered to regulate the importation of a large number of commodities, among which are the following: Bronze, brass, zinc, railway material, steel beams and girders, pig iron, steel ingots and blooms, steel and iron bars and rods, and high speed steel.

Declares Engineers Avoid Public Life

In the last issue of the *Michigan Technic* published by the University of Michigan, E. H. Sniffen, manager of the power department of the Westinghouse Electric & Manufacturing Co., writes at considerable length on the question of the engineer and the community. The whole trend of the paper centers around the relative lack of prominence of the engineer in the community. "Why is the engineer not a more conspicuous citizen?" asks Mr. Sniffen. "Why do we not have more of the benefit of his trained mind in our public affairs? Shall we leave it to the lawyers to hold public offices?" The membership of the sixty-fifth congress contains not a single engineer in either the upper or lower house. The scientific and mechanical achievements have been the biggest things in the development of our country and it must be a matter of chagrin to think that there are few among our engineers or scientists whose voice is heard in our national councils. The remedy for this difficulty Mr. Sniffen feels is in the schools. Technical graduates have shown too much the effect of a specialized training at the expense of general education. The fault also is with the engineer. He will not be picked from his profession to serve in public life. He must himself show social and public activity.

The Gillette Safety Razor Co., Boston, has issued a statement covering its 1919 activities. During the year the company extended its Boston plant so as to increase the capacity by 15,000,000 dozen blades per year, bringing the total capacity to 25,000,000 dozen. Nearly 2,500,000 new razors were sold in 1919.

Microscope Aids Study of Iron

Investigation of Structure of Malleable Iron by Means of Microscope Reveals Certain Defects Impossible of Identification by Other Means— Significance of Structural Characteristics Explained

BY ENRIQUE TOUCEDA

AS IN the case of steel and the nonferrous alloys in general, the use of the microscope in connection with the manufacture of malleable cast iron has proved of inestimable value to the industry. Had its use not been invoked, many facts either would not be known at all or, if suspected, would be confined to the realms of conjecture. No fairer statement could be made than that the start of real progress in the industry was coincident with the application of metallography to the product, though the full significance of this statement can hardly be appreciated except by those who not only are conversant with conditions as they existed at the time referred to, but are familiar with the character of works' practice at the present time.

A few years ago, about the only test made to ascertain the physical properties of the product, except in the case of certain plants, was the bending of a casting to destruction, not only with the object of discovering whether or not the metal was ductile, but for the purpose of inspecting the fracture. The characteristics of the fracture, if correctly interpreted, were known to be of value in locating the trouble in castings that were inferior. In general, it was found that if a casting of medium or heavy section would bend through a wide angle before failure took place, the fracture in the majority of cases would have a black velvety appearance; while if it was held at different angles to the direction of the rays of light, it would show a change of color and an iridescent sheen. But an inferior air furnace heat or anneal might yield castings which, if thin and consequently largely decarburized, could be bent double on themselves and still not possess the fracture described. If, on the other hand, a casting broke short, its fracture might have one of a great many different color and structural peculairities. Depending on the cause of the trouble, such castings might have any of the many fracture characteristics.

It was the invariable custom to inspect carefully the fracture of any broken casting. When the pots were withdrawn from an annealing oven and dumped, various castings were selected for the bending test. If any broke short, the annealer and melter and, perhaps, the superintendent, would try to locate the cause of the trouble. But it was seldom that any two of the men were in accord as to why ductility was lacking or what corrective measure might rectify the condition. The annealer would endeavor to shift the responsibility to the melter, while the latter would complacently state and insist that inasmuch as the hard iron castings were similar in all particulars to previous air furnace heats that had but recently annealed in a satisfactory manner, it was plain that the trouble was that the castings had been under or over annealed, etc. The consultation would invariably end with nothing definite being determined because the opinion given in each case was unaccompanied by tangible proof. Matters were rendered more uncertain and further complicated, by reason of the fact that the castings from three or four air furnace heats are annealed together in the same oven; it is impractical to keep the castings from the various heats separated, due to which the air furnace heat to which belonged the casting under discussion cannot be indentified.

Should Provide Proper Facilities

The writer has been associated with the manufacture of malleable-iron castings since 1894. In 1904, he became convinced that while practical experience combined with close observation, when accompanied by a good metallurgical foundation, made possible the explanation and elimination of many of the troubles encountered, works' control could never be satisfactorily attained without proper facilities for a study of the structure rather than the fracture of the annealed product. Steps were then taken to secure the best metallographic outfit available and, with the aid of a small electric resistance annealing furnace and this outfit, more knowledge was obtained in three months than in the previous 10 years. Toward the end of 1911, the writer was engaged by the American Malleable Castings association as its consulting engineer. At that time, few, if any, of the members suspected that the microscope could be used as an aid in their work. Today, not only are many of the members equipped with a metallographic outfit, but those who are not make constant use of the one installed in the general laboratories of the association.

As a partial list of fracture characteristics has been given, it is pertinent at this point to make a similar one covering the various structural characteristics that are encountered from time to time. This will necessitate a division of the list into two classes, which must be considered separately for the reason that an anneal may be conducted with most painstaking care and precaution and the castings have an abnormal fracture and structure, in the event that the composition of the hard iron castings is such as to inhibit, in part or almost wholly, the breaking up of the carbides; while on the other hand the hard iron composition may be the most desirable, and an abnormal structure result solely from failure to observe those conditions vital to a correct anneal. If a hard iron casting of correct composition is efficiently annealed, its structure will consist of a ground mass of ferrite, throughout which will be quite uniformly distributed a number of fairly well-rounded nodules of free carbon. The fewer the number and the smaller the nodules, the greater will be the ductility of the metal.

Irrespective of whether the castings have been placed in an active packing, one containing a certain percentage of iron oxide, or in one that is inactive, such as ashes, sand, ground firebrick, etc., there always will be found a sur- almost completely decarburized, of a face border in the section that has been depth that will vary from one that is hardly noticeable to one that will at times exceed $\frac{1}{8}$ inch. The writer believes the foregoing to cover what can be considered a perfectly normal structure for annealed malleable cast iron, although if a slight outer layer of pearlite is found, surrounding an inner ring or layer of ferrite that is located between the former and the metal enclosed within these two layers, or if the position of the ferritic and pearlitic layers is reversed, the structure should

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Structural Characteristics of Annealed Castings

STRUCTURAL CHARACTERISTICS OF IMPROPERLY ANNEALED CASTINGS OF SUITABLE HARD IRON COMPOSITION

A ground mass of ferrite—particles of free carbon distributed quite uniformly throughout—associated with a small amount or, at times, a great abundance of free cementite, indicates that the annealer failed to raise and hold the oven to a temperature in excess of the critical, or that the casting was not held long enough above the critical temperature to accomplish completely the breaking up of the carbides.

The presence in the ground mass of considerable pearlite, with rings of ferrite surrounding the particles of free carbon, indicates too quick cooling through the critical range. If these characteristics are confined toward the outer portion of the section, the rate of cooling was but slightly too rapid; if they exist throughout the section the cooling was much too rapid.

A structure normal in all particulars except for the presence of an outer rim of pearlite, corresponding to a steel of from 0.60 to 0.85 per cent carbon, contaminated at times by the presence of considerable free cementite, indicates the presence of a carburizing atmosphere in the pot.

STRUCTURAL CHARACTERISTICS OF PROPERLY ANNEALED CASTINGS THAT SHOW ABNORMAL STRUCTURES DUE TO AN INCORRECT HARD IRON COMPOSITION

A fairly uniform ground mass mixture of ferrite and pearlite, throughout which are quite uniformly distributed particles of free carbon, indicates very low silicon or manganese or both.

A ground mass of pearlite throughout which are quite uniformly distributed particles of free carbon indicates very high manganese.

A ground mass mixture of ferrite and pearlite, surrounding which is a layer of pearlite and surrounding the latter a ring of decarburized metal, may be caused by a number of conditions.

A ground mass containing more or less primary graphite indicates that the hard iron was contaminated with uncombined carbon.

still be considered normal under the assumption that the pearlitic layer, irrespective of location, is not high enough in carbon to make machining difficult.

Microscope in Malleable Industry

Up to a comparatively few years ago a diagnosis of the fracture was the chief means employed for determining the cause for the superiority or inferiority of the metal in the castings and as, for the same hard iron composition, the appearance of the fracture will vary to a considerable extent, the higher the temperature of anneal, the diagnoses were frequently incorrect. The writer knows of no metallurgical industry in which the use of the microscope has proved so indispensable as in the manufacture of malleable iron castings. He is also positive that there are many troubles, the exact cause of which cannot be definitely located without its aid.

It must not be assumed, however, that in all cases dependence on the use of this instrument alone will disclose the true and complete story, for what may be shown by the fracture, the structure, and the chemical composition must, in many instances, be carefully considered too before an accurate diagnosis can be rendered. For example, consider the case in which the hard iron composition of a casting yields, when annealed in accordance with best practice, a perfectly normal structure but an abnormal fracture. Such case were of very frequent occurrence in the past and, doubtless, are not infrequent today. When certain constituents are present in the iron in certain amounts, they can affect the ductility of the ground mass without having any appreciable effect in preventing the complete graphitization of the carbon during the anneal; and when the ductility of the ferrite is lessened, a more or less granular and grayish or steely fracture will result, for the ferritic grains instead of stretching out in spines will break short, producing facts that will reflect light and yield the appearance indicated. Obviously, then, if a person received a micrograph accompanied by a statement that it was truly typical of the structure and he was requested, from its inspection, to pass upon the physical properties of the casting, he would be forced to confine himself strictly to the general statement, that while it could be determined from the micrograph that the anneal had been conducted in accordance with good practice, because graphitization was complete and the grain size good, no prognostication as to physical properties could be vouchsafed unless information concerning the fracture characteristics, or the chemical composition, or both, was furnished.

On the other hand, quite numerous are the cases in which the microscope plays the dominant rule. There are certain defects, the nature of which can be revealed only through metallographic means. The presence of slag, of primary graphite, the structural characteristics of the ground mass, the conditions that manifest themselves in the fracture arising from an unsuitable pot atmosphere, whether or not an area seen in the fracture, through contrast, to be different in appearance from the rest of the section is the result of segregation, or is due to some other cause, such as a slight shrink, etc., are impossible of identification in any manner known to the writer other than through microscopic investigation. In the opinion of the writer the use of the microscope in the malleable iron industry is mandatory.

British Tool Builders Out for Foreign Trade

According to the *London Times Engineering Supplement* an important change which has taken place in the British machine tool trade is the tendency of all manufacturers to specialize on a more restricted manufacturing program. The object of this change is to increase output, perfect designs, and produce as cheaply as possible in order to obtain a larger share of oversea trade. The formation of a British Machine Tool association was a step in the direction of specialization, and as far as export trade is concerned gives every indication of proving a success. For the time being, however, export business is restricted on account of the question of delivery and the difficulties associated with exchange, but there is a strong tendency on the part of foreign buyers to investigate the possibilities of the British market before settling their orders, so that when the financial aspect has improved orders will undoubtedly result. The Indian market especially presents a splendid opportunity owing to the expansion of the engineering industry in that country, and for the time being the lighter and cheaper class of tools, especially in sensitive radial and vertical drilling machines, lathes, and punching and shearing machines, are likely to command a ready sale. One large firm in Bombay is stocking its show room and placing orders for the following range of machine tools, which it considers covers the range of present urgent requirements:

Lathes

Three 6 feet with 6½-inch centers and 8½-inch width of bed.
Three 8 feet with 8½-inch centers and 11½-inch width of bed.
Three 10 feet with 9½-inch centers and 13-inch width of bed.
Three 12 feet with 12-inch centers and 16-inch width of bed.

Pillar Drilling Machines

Two double-geared vertical drilling machines to admit 26 inches with circular table.
Two 20-inch sensitive drilling machines to drill 1¼-inch holes.

Shaper

Two self-acting double-geared shaping machines with center thrust to ram and quick return motion. Stroke of machine 12 inches.

Bench Drilling Machines

Six self-feeding double-geared hand-power machines to drill 1¼-inch holes, 6-inch depth of feed drilling center 14 inches with circular table.

Punching and Shearing Machines

Two hand and power machines to punch ⅝-inch holes through ⅝-inch plates and shear ⅝-inch plates with angle shear.

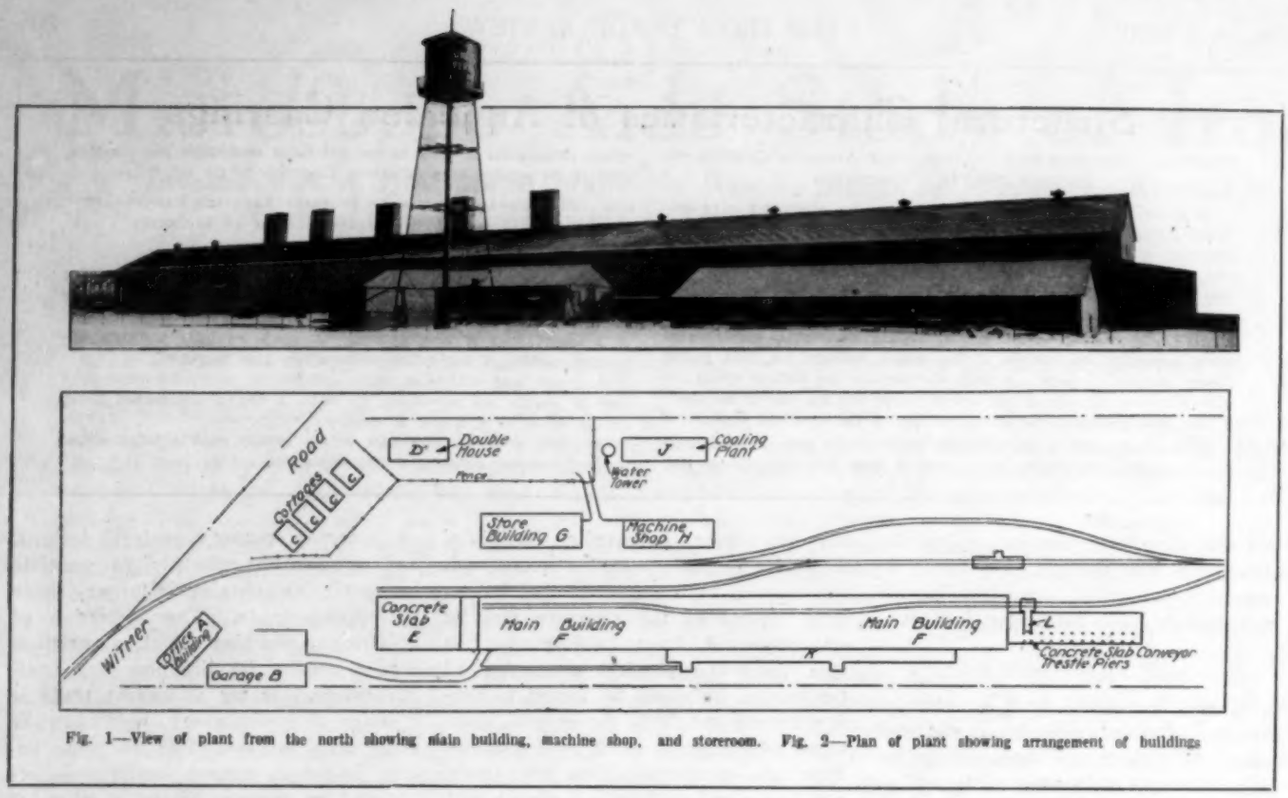

Fig. 1—View of plant from the north showing main building, machine shop, and storeroom. Fig. 2—Plan of plant showing arrangement of buildings

Builds Electric Ferroalloy Plant

Power From Niagara Falls is Utilized in Making Ferrosilicon, Ferrochrome and Other Products in New Plant of United States Ferro Alloys Corp.—Units Aggregating 11,000 Horsepower Now in Operation

ONE of the notable developments in the manufacture of ferroalloys in the electric furnace, was the completion in 1919 of an extensive and modern plant by the United States Ferro Alloys Corp., Niagara Falls, N. Y. The plant is situated on the Witmer road, on the north side of the city in close proximity to the electrode plants of the Republic Carbon Co. and the National Carbon Co.

The present plant, covering an area of 10 acres and forming part of a 30-acre site purchased by the United States Ferro Alloys Corp., is only the beginning of an extensive program which has been projected by the company. The site lends itself to future extensions, as it has a depth of over 4000 feet, permitting the installation of a central track system of railroading to serve the different departments from each side of the system.

Work was started on the plant in June, 1919, and the first unit of 4000 horsepower was put in operation on Oct. 15. At the time this is being written, about 11,000 horsepower is in operation and the company estimates that by June, 1920, from 15,000 to 16,000 horsepower will be utilized.

The principal products of the company are ferrosilicon and ferrochrome, but other products will be added later. The initial program covers the installation of furnaces producing four different products, which will utilize from 21,000 to 22,000 horsepower. The company intends to have this amount of power in operation before the end of the current year.

The main furnace building, shown in

FIG. 3—ENTRANCE TO PLANT SHOWING OFFICE BUILDING AND COTTAGES ERECTED FOR DEPARTMENT FOREMEN

Figs. 1 and 4, is the largest in America devoted to the ferroalloy industry. The transformer room, indicated by *K*, Fig. 2, is a solid brick lean-to on the south side of the furnace building. It has sufficient floor space to receive equipment for 25,000 horsepower in transformer capacity. An interior view of the transformer room is shown in Fig. 5.

The furnace building is served by three electric traveling cranes, and a track system extends through the entire length of the building, permitting the receiving of raw material and the shipping of the finished product when weather conditions do not permit outside operations. An elaborate system of bins has been installed for the storage of raw materials and finished products, these bins being of sufficient capacity to insure the operation of the plant for several weeks, should unfavorable weather conditions interfere with the receiving of supplies and their reception in the furnace building.

Every care was taken, in the designing of the plant, to reduce manual labor to a minimum. A car unloading plant, indicated at *L*, Fig. 1, was installed for dumping material from the cars into a hopper between the rails, from where it is conveyed by means of elevators and conveyors directly to the bins inside the furnace building. The material also can be carried by the same conveyors to the yard storage and unloaded there.

The trackage facilities system, for receiving and weighing raw material, side tracking cars and loading finished products, include nearly a mile of standard gage track. The system is served by locomotive cranes and one auxiliary locomotive.

A machine shop, *H*, Fig. 1, takes care of the maintenance and repairs to the plant and buildings. The building also contains a storeroom. A second storeroom, indicated by *G*, has been provided for the storage of heavy machinery and also for the higher priced raw materials.

FIG. 5—TRANSFORMER ROOM WHICH EXTENDS ALONG SOUTH SIDE OF MAIN BUILDING

The plant is provided with a sprinkler cooling system, *J*, the hot water being returned from the different points in the plant to a system of pumps, which pump this water into the sprinkler system. The water, after being cooled, is again pumped from the main reservoir to a water tower, from which it is returned again to perform its cooling functions wherever required.

Has Own Chrome Ore Mines

To insure a steady and sure supply of chrome ore, necessary for the production of ferrochrome, the company control and have contracted for, the total output of large and rich mines.

The office, indicated by *A*, Fig. 1 and shown in Fig. 3, is a substantially built brick building, with offices and laboratory on the ground floor. The upper floor contains living quarters for the caretaker, drafting-room, dining-room and large recreation room for the employes. A large garage, *B*, has been built east of the office building. Cottages have been provided for the foremen of the different departments, and also houses for the workmen. Power is supplied to the company from one of the hydroelectric plants at Niagara Falls.

The company is capitalized at $3,000,000 all paid in. Parker Sloane, vice president of the Roosevelt bank, New York, is president and active head of the corporation; H. C. Sicard is the treasurer; and William Douglas Sloane is manager of sales. R. Turnbull is managing director of the company, and will confine his efforts principally to the manufacturing and production end of the business. The head office of the company is at 30 East Forty-second street, New York.

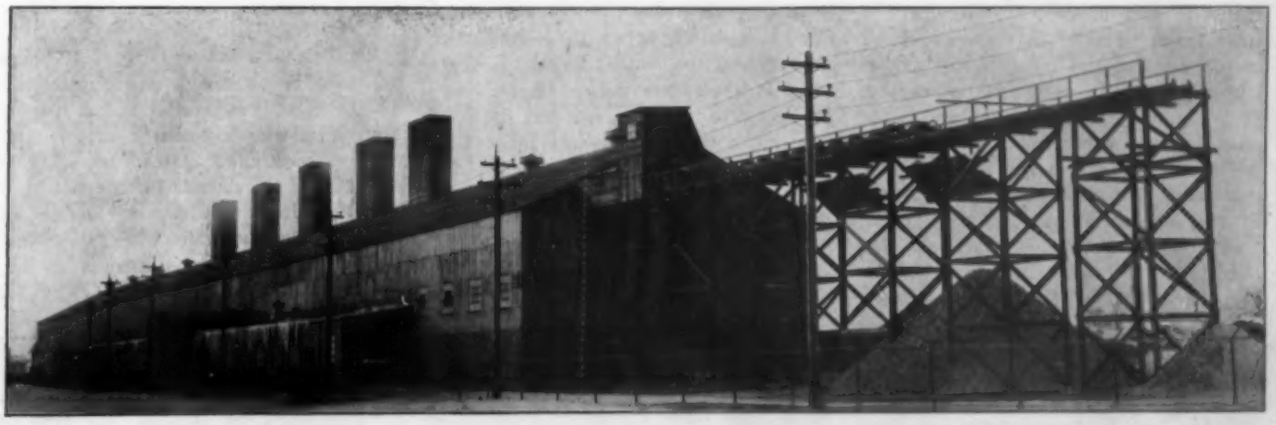

FIG. 4—EAST END OF MAIN BUILDING SHOWING UNLOADING EQUIPMENT FOR RAW MATERIALS

Conserving Nation's Coal Supply

Briquetting, Pulverizing and Coking Permit Use of Mine By-Products Heretofore Wasted—Electrification of Railroad Motive Power and Creation of Large Electric Power Zone in East Advocated

BY EDWIN LUDLOW

COAL can be conserved by more complete extraction and better methods of mining, utilizing the entire output of the mines and obtaining the maximum efficiency in the use of coal.

A million or more tons a year of fine coal are being thrown away for which there are now being developed three methods of utilization. Briquetting gradually is becoming more successful with various experiments, until now several briquetting plants are in operation and others are in contemplation.

Grinding fine coal dust so that it will pass through a 400-mesh screen and permits its use as pulverized fuel. Plants of this kind have been erected at the mines and a plant is being erected in the cement region. Pulverized fuel has been used for some time with bituminous coal but it is only recently that developments have been made that make it practicable to burr anthracite in this form.

Coke for Domestic Use

The third utilization of this waste is in the form of coke, which can be crushed down to stove coal size and used for domestic purposes the same as the prepared sizes of anthracite. This process was invented by Donald Markle, who found that by adding pitch to the fine anthracite a very good coke could be made in by-product ovens. The process is now being developed by the Delaware & Hudson Co. under his direction.

In the soft coal field, a waste product is the boney coal produced in Westmoreland and other districts, where a large bench of this coal is encountered in the vein and is thrown away as being too high in ash. It is capable of being used in gas producers and a plant located at the mines could utilize this waste product in the generation of electricity, increasing the power supply of that section of the country.

One of the greatest methods for stabilizing the coal industry and permitting the operation of the mines to their maximum capacity is by the installation of central electrical power plants. This can only be accomplished by the electrification of the railroads. The results, as given by W. S. Murray, who had charge of the electrification of the New York, New Haven & Hartford railroad, indicate that passenger engines use twice as much coal when steam fired as when operated electrically, and that for freight and switching engines the quantity is from three to four times as much. He also states that the repair of electric locomotives is only one-half as much as steam and they are capable of more continuous service and have better tractive force.

Would Electrify Motive Power

The question of economy in the use of electric motive power on the railroads is no longer one of theory and the only obstacle to be overcome is the large initial expenditure required to make the change. The railroads now burn 26 per cent of the total output of the bituminous mines; with electrification this would be reduced to 10 or 12 per cent. Freight congestion and car supply troubles also would be solved, as the central power plants in the coal producing states could be located at a group of mines, requiring only a minimum of switching service. Coal too high in sulphur for safe storage could then be burned as produced and the mines kept in continuous operation. For railroads not passing through coal fields, the power plants would require storage facilities to permit an accumulation of coal in the summer months.

Another extremely wasteful method of using coal is in the old fashioned beehive coke ovens, which are gradually disappearing here. In Europe they were found too uneconomical 30 years ago. It has been estimated that enough gas goes to waste from this type of oven along the Pennsylvania railroad to furnish the electric power needed for that railroad between Pittsburgh and Altoona.

Waste in Use of Coal

In the use of bituminous coal, there is the greatest extravagance in nearly all parts of the country and very little attention has been paid to obtaining the full heating value of the coal received. At a large plant I recently visited, the president pointed with pride to the fact that he always purchased the highest grade coal and insisted that it should have at least 15,000 B.t.u. I called his attention to the fact that his steam results showed that he was only obtaining 11,000 B.t.u. and by improving his boiler and closing up the leaks he could obtain the same amount of steam with an inferior coal or use a much less quantity of the higher grade.

Grading Plants on Efficiency

During the functioning of the conservation committee of engineering council, this question was very thoroughly discussed and if the coal shortage had continued it had been determined that there should be a complete survey made of steam plants and that they would be rated by inspectors as *A, B* and *C*. In class *A* would be the essential industries obtaining a maximum efficiency of their coal; these would be entitled to preference in obtaining coal. Class *B* would include the essential industries that were not burning coal efficiently; their attention would be called to the fact. Class *C* would cover the other industries which were neither essential nor were burning coal to obtain the best results. Preference in shipments would be given in the order of *A, B* and *C*. It was felt that there would be a great improvement in boiler practice throughout the country if the attention of the owners was called to the fact that they were liable to be refused coal unless they improved their boiler practice. We had gone to the extent of negotiating with the boiler insurance companies for the use of their inspectors to make these surveys.

Roads Saved Coal in 1919

Another most wasteful form of burning coal is in the steam locomotive. This subject was taken up by Eugene McAuliffe, who had charge of the matter for the United States fuel administration, and the reports for the fuel conservation for the first nine months of 1919 are now available. They show that, in straight freight and passenger service, the roads reporting consumed 76,285,955 tons of coal. as compared with 88,727,045 tons in the corresponding period in 1918. The average cost of coal in 1919 approximated $3.45 per ton, and in 1918 $3.25, an increase for 1919 of less than 6 per cent. The most significant figures are those bearing on unit

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performances. These show that in 1919 186.1 pounds of coal were consumed per 1000 gross freight ton-miles, as compared with 201.2 pounds in 1918. Consumption per passenger train car-mile, in 1919, was 17.9 pounds, while for the same nine months in 1918 it was 19.3 pounds. In other words, the increased efficiency obtained per unit of service made the fuel cost per 1000 gross ton-miles and per passenger train car-mile less with the higher priced coal of 1919 than was true in 1918 when coal costs per ton were lower. When the difficulties in policing railroad efficiency systems in coal consumption, because of the nature of transportation service, are contrasted with the ease with which the similar regulations can be enforced in a stationary plant, the advantages that will accrue to the managers of the latter type from an intensive study of the question of how much serivce can be developed from a ton of coal are readily apparent.

It has been shown how great an economy in coal consumption can be accomplished by electrification of the railroads; still greater fuel economy can be obtained by the use of electricity in manufacturing plants. The estimated saving is nearly one-tenth, as the losses in steam consumption of a plant running eight hours and maintaining its boiler plant for 24 hours would be entirely obviated by the purchase of electric power and the payment for only such power as was actually consumed.

Sees Relief for New York

Attention has been called to this subject by former Secretary Lane and it has been suggested that an appropriation be made for the study of a high-power trunk line between Boston and Washington, into which would be fed the power generated, as far as possible, hydro-electrically; from power plants at the coal mines; where they are within reasonable distance of this trunk line; and by the construction of large power plants at tidewater, where coal could be brought in by both boat and rail. Such a power plant is needed in New York almost more than anywhere else. Every strike of longshoremen or tugboat captains or a tieup from bad storms brings out big headlines that the coal situation in Manhattan island is bad and that probably after a few days the subways and elevated roads will have to close down for want of fuel. It is manifest that no large storage can be maintained on Manhattan island with its limited area and high cost of land. The Newark meadows, however, can easily be reached by all the coal-carrying roads coming into the neighborhood of New York, and also can be reached by boats from Norfolk or Baltimore. A central power plant erected there could have an unlimited storage, under water, if desired, for the soft coal that is in danger of spontaneous combustion, and coal could be brought in at the minimum of expense and unloaded on these storage piles, insuring a sufficient reserve to tide over any possible storm or ticup.

High power trunk lines connecting this power plant to the present generating plants of the Edison, Interborough, and Brooklyn Rapid Transit companies and other large electric consumers would change those plants, and the present boiler plants could be used in emergencies and their substations for the high-tension power coming in from the central plant. Such a central power plant could be expanded to sell electric power to the railroads entering New York and all the advantages of an enormous concentration with the highest technical advice and the greatest efficiency could be well afforded at a plant of that kind, which would be a model for the country, and New York's troubles in heat and light, to a large extent, would be eliminated by having a power plant of sufficient capacity to take care of all of its needs with storage piles to enable it to operate every day in the year irrespective of any local troubles affecting harbor transportation, which now is such an important factor in the fuel supply of New York city. With the successful operation of this power plant, others could be built at Baltimore, Philadelphia, Boston, and Providence and by connecting them with a main trunk line, intermediate industries would receive their electric power at a minimum cost.

While the initial expenditure for such a plant would be high, the saving of $100,000,000 a year, which has been estimated as the amount that such a trunk line could save to the industries along the Atlantic coast, would well repay the interest on the investment required.

Would Create Power Zone

ONE of the features of the eighth midwinter convention of the American Institute of Electrical Engineers recently held at the Engineering Societies building, New York, was a symposium on the economical supply of electric power for the industries and railroads of the northeast Atlantic seaboard. In introducing the subject, W. S. Murray, consulting engineer, New York briefly summarized a so-called superpower plan for concentrating in one large electric power unit the energy generated at hydro-electric plants on the streams and at steam power plants situated at coal mines and on tidewater at the cities. The main power distribution line would pass from Lawrence, Mass., through or near Lowell, Boston, Providence, New Haven, New York, Newark, Trenton, Philadelphia, Wilmington, Baltimore and Washington. Tap lines would extend from the main line to soft coal fields northwest of Philadelphia, to the hard coal fields near Scranton, and to Cedar Rapids on the St. Lawrence river.

It is claimed that the plan provides a means by which the present estimated machine capacity of 17,000,000 horsepower, divided 10,000,000 for industrial purposes and 7,000,000 for the railroads, in a region between Boston and Washington and inland from the coast 100 to 150 miles, now operating with a load factor not exceeding 15 per cent, can be lifted to a load factor of greater than 50 per cent and possibly 60 per cent. It is

MAP SHOWING BOUNDARY OF PROPOSED SUPER-POWER ZONE

further claimed that the plan will be the means by which, conservatively speaking, one ton of coal will do the work of two, and railroads within the above zone and those carrying coal into that zone will be relieved of transporting one-half the amount of fuel now required for power and lighting purposes.

According to the sponsors of the plan the proposal means that a present plant capacity of 17,000,000 horsepower can be replaced by one not greater than 5,500,000 horsepower, and that no less than 30,000,000 tons of coal can be saved per year. It is said that the plan offers immediate relief from the present intolerable congestion by automatically increasing rail capacity without increasing track mileage and reducing power equipment investment. By creating an overhead common carrier system of power it is proposed to cut in half the present cargo space required for industrial coal, double the service factor of all kinds of train equipment and transfer the present steam power equipment replaced by electrical apparatus to other sections of the country where it is so vitally needed for many purposes.

Engineering features of the superpower plan were discussed by W. Le R. Emmet, consulting engineer, General Electric Co.; J. F. Johnson, engineer turbine department, Westinghouse Machine Co.; H. G. Reist, engineering department, General Electric Co.; F. D. Newbury, power engineering department, Westinghouse Electric & Mfg. Co.; W. B. Potter, chief engineer, railway and traction deparment, General Electric Co.; Philip Torchio, chief electric engineer, New York Edison Co.; Percy H. Thomas, consulting electrical engineer, New York; W. D. A. Peaslee, electrical engineer, Jeffry-Dewitt Insulator Co., and A. O. Austin, chief engineer, Ohio Insulator Co.

Applying Metallurgy in the Foundry

AT A recent meeting of the New England Foundrymen's association in Boston, Dr. Richard Moldenke, Watchung, N. J., talked on the practical application of metallurgy in the foundry. Cast iron or gray iron, he said, may be considered as steel plus graphite and when looked at from this point of view it will be seen that all of things ordinarily affecting steel also affect cast iron, and further that when the iron part of cast iron, that is, the metal independent of graphite, is considered, its composition and characteristics agree closely with those of steel.

Dr. Moldenke started with the fundamental facts of metallurgy and brought out clearly the simplicity in applying many of the results which had been obtained through years of research. Cast iron is composed of six or seven main constituents, and if the effects of varying amounts of these few elements is known, nearly all casting problems may be solved, at least as far as the composition of the metal is concerned. The effects of most of the elements have been carefully studied and may be said to be known within certain limits. The effect of oxygen however, is still subject to some controversy. Dr. Moldenke feels that this element plays a more important role in cast iron than is usually conceded. Oxygen tends to increase the rapidity of setting.

Dioxidizing agents such as chromium and nickel tend to increase the temperature range of the molten metal and to increase the strength of castings.

According to Dr. Moldenke the three principal problems are the effect of sulphur in varying proportions on the quality of cast iron, the discovery of a good refractory coating material for finishing molds, and gating.

The first problem is important because of the increasing amount of sulphur occurring in scrap and also because of the greater demands for conservation and the fact that large bodies of ore now practically unused because of high silicon content might be available if more was known about the effect of sulphur in cast iron.

A solution to the second problem would overcome the present difficulty caused by the streaking and erroding action of molten metal on graphitic washes and other coatings now used. The third problem involves the difficulty of getting iron into molds in the proper way to avoid shrinkage and uneven cooling in the case of complicated work where light and heavy parts are close together. To improve the strength of cast iron two things may be done. Either the graphite may be reduced or the steel portion may be improved. The usual way to increase the quality of the so-called steel portion of cast iron is to add nickel or some other similar metal.

By adding steel and keeping up the silicon value it is possible to get strong iron which is still machinable. This produces the so-called semisteel castings but the name has been greatly abused. Dr. Moldenke feels that there is now an urgent need for the standardization of different grades of cast iron. He explained at considerable length the different types of castings and the different kinds of iron required for each. He also spoke about the piling of pig iron so as to separate the different grades of silicon. This subject was brought to his mind, he said, by a recent editorial in *The Foundry*. He said, however, that he would go a step further than suggested there and would pile according to different brands as well as different silicon percentages. Much may be done by the foundryman in knowing what the actual cost is for different kinds of scrap when forming a part of his castings.

Schwab Discounts French Steel "Discovery"

Charles M. Schwab, chairman of the Bethlehem Steel Corp., on the morning of his fifty-eighth birthday, Feb. 19, while glancing at the morning papers, noticed the story with regard to a discovery by Belgian and French steelmakers, after experiments in the outskirts of Paris, of a new method by which alloy steels might be produced at the same cost equal to that of producing ordinary steel. The discovery was characterized as a "revolution in steelmaking." "Why," Mr. Schwab commented later, "the new process amounts to nothing more than we have been doing in this country for years. They say the French and Belgians have invented a secret process by which they can manufacture nickel, chrome and similar steels at a cost amounting to not more than a high-grade bessemer, plus the cost of the alloy. That is just what has been going on in the mills in this country right along. They don't know anything over there that we don't know."

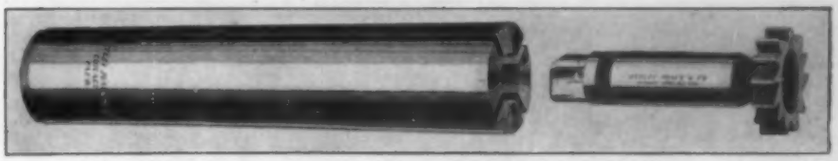
Traces the Early History of Use of Iron

Dr. John S. Unger, chief of the bureau of research of the United States Steel Corp., was the chief speaker at the regular monthly meeting of the Pittsburgh Foundrymen's association, at the Chatham hotel, Monday, Feb. 16. Dr. Unger substituted for Louis E. Endsley, professor of mechanical engineering, University of Pittsburgh, who was to have been the principal speaker, but who was unable to be present on account of illness. Although iron never is given rank as among the earliest of metallic discoveries, Dr. Unger took issue with this belief and asserted that there is authority for the claim that Enoch, son of Cain and grandson of Adam, actually discovered iron in the ashes of the smouldering camp fires along the banks of the Euphrates river. The speaker entertainingly traced the history of iron, both from a geological and chemical standpoint, and ventured the prediction that not only would the country soon be using ore of much lower metallic content than that now used, but that within 100 years, iron would be supplanted by an alloy derived from clay, containing iron, silica and alumina, which he said would be a third the weight of iron and considerably stronger.

Montfort Jones, professor of economics, University of Pittsburgh, gave a talk on the foreign exchange situation, in which he pointed out the dangers to foreign trade unless the present rates were soon adjusted and also the danger of the reshipment of American products to this country because of the big premium which the American dollar commands over foreign units of coin.

Applies Safety Lever to Stamping Press

An effective safety device for protecting the hands of the operator on a motor driven side press has been improvised and adopted in the machine shop of the Square D Co., Detroit. The movement of the dies is actuated by a tread or lever which throws the clutch. Without the safety device, the operator while operating the press with his right hand, may unconsciously fail to remove his left hand from the metal he has placed on the die and thus lose his fingers or perhaps his entire hand when the press closes. To prevent this, a lever for the left hand also is provided, as shown in the accompanying illustration. This is connected by the means of a rod in the rear of the press to the right-hand lever, so that both levers must be held down at once to throw the clutch. To press but one only raises the other lever and allows the clutch to slip. The operator is compelled to keep both hands out of danger in order to operate the press. The machine stamps, presses, and perforates sheet steel into boxes which are used to enclose the live parts of electric switches.



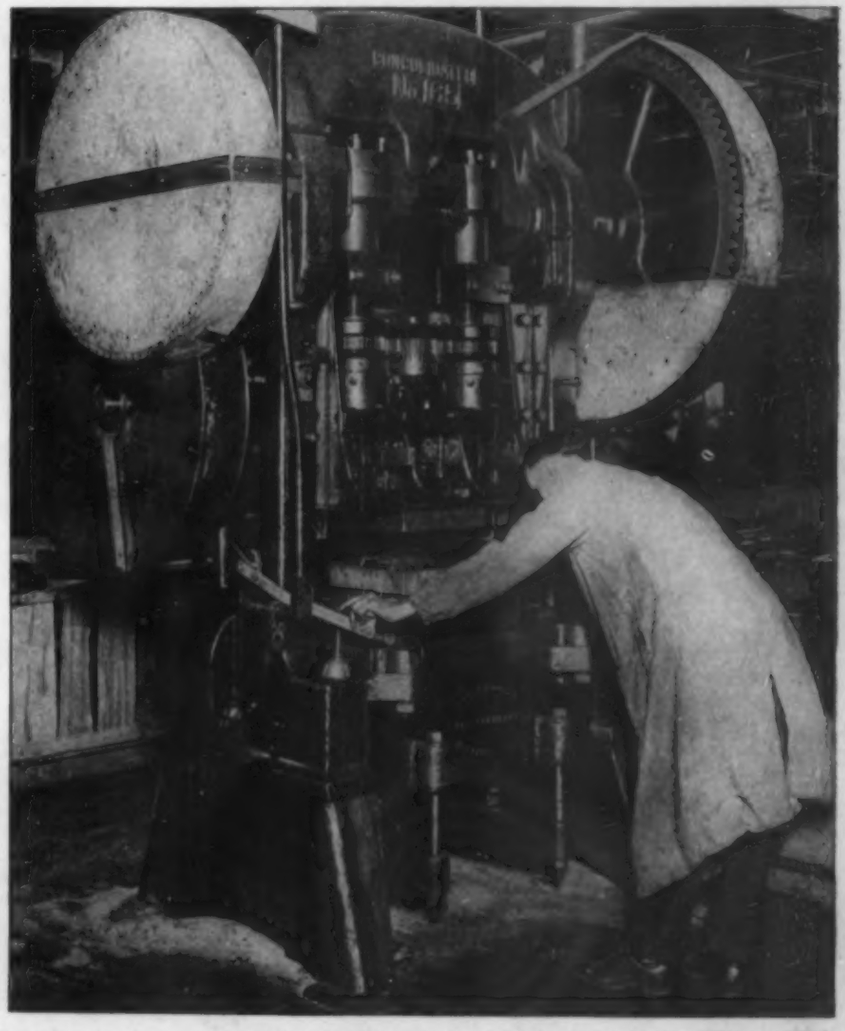
ONE PIECE COLLET FOR HOLDING END MILLS

Embodies Collet Principle in Keyway Chuck

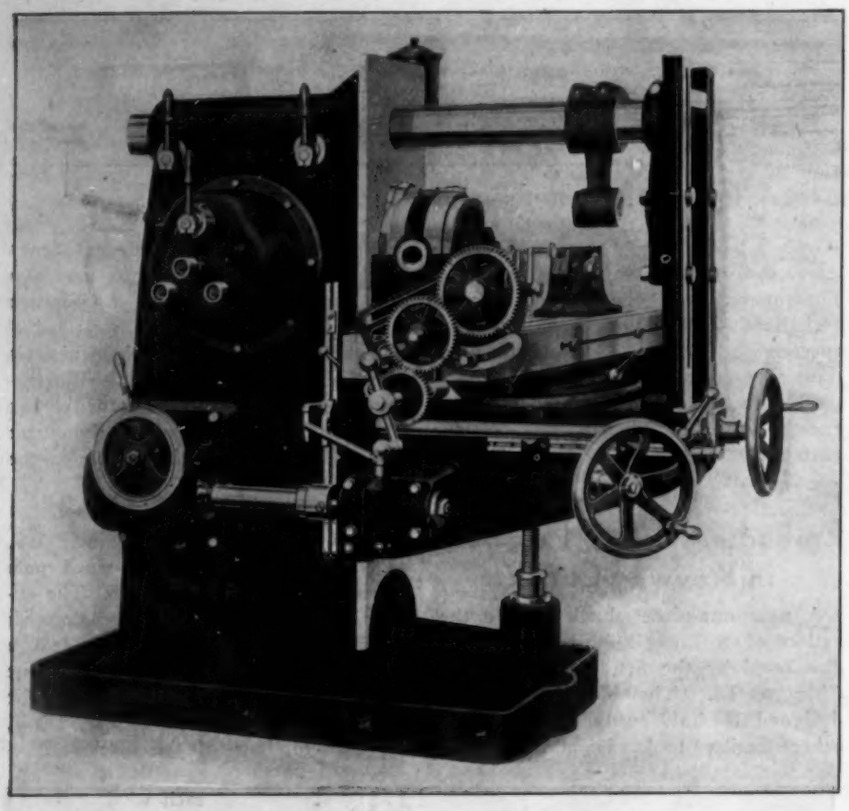
A new one-piece chuck having the action of a draw-in collet has been developed by the Scully-Jones & Co., Chicago, Ill. The chuck, which is designed to hold milling cutters and other similar tools, is made in the various tapers used on different types of machines and is said to insure a true running cutter and a positive drive.

In addition to the chuck, which is shown in the accompanying illustration, the Scully-Jones company has recently brought out a keyway cutter with a squared shank, as shown in the illustration.

The Union Iron Works at Bangor, Me., has orders for 22, 4-pocket wood pulp grinders weighing 12 tons each. The export demand for these grinders is rapidly increasing. Three were sent a month ago to Tokio, Japan and one recently to Sault Ste. Marie, Ont. The Itasca Paper Co., Grand Rapids, Minn., has ordered four of the machines.



AUTOMATIC SAFETY LEVER APPLIED TO SIDE PRESS FOR STAMPING ELECTRIC SWITCH COVERS



NEW NO. 3 UNIVERSAL MILLING MACHINE WITH UNIVERSAL DIVIDING HEAD IN PLACE

New Milling Machine Has Helical Gear Drive

Having taken over the entire output of the Conradson Machine Tool Co., Green Bay, Wis., Joseph T. Ryerson & Son, Chicago, is now placing the new line of Ryerson-Conradson machine tools on the market. The first machine is the No. 3 high power milling machine shown in the accompanying illustration. This machine, which is designed for light and heavy manufacturing and jobbing work, is equipped with a helical drive, giving great steadiness. The difficulty previously met in applying this drive to milling machines was to obtain a sufficient range of speed for a commercial miller.

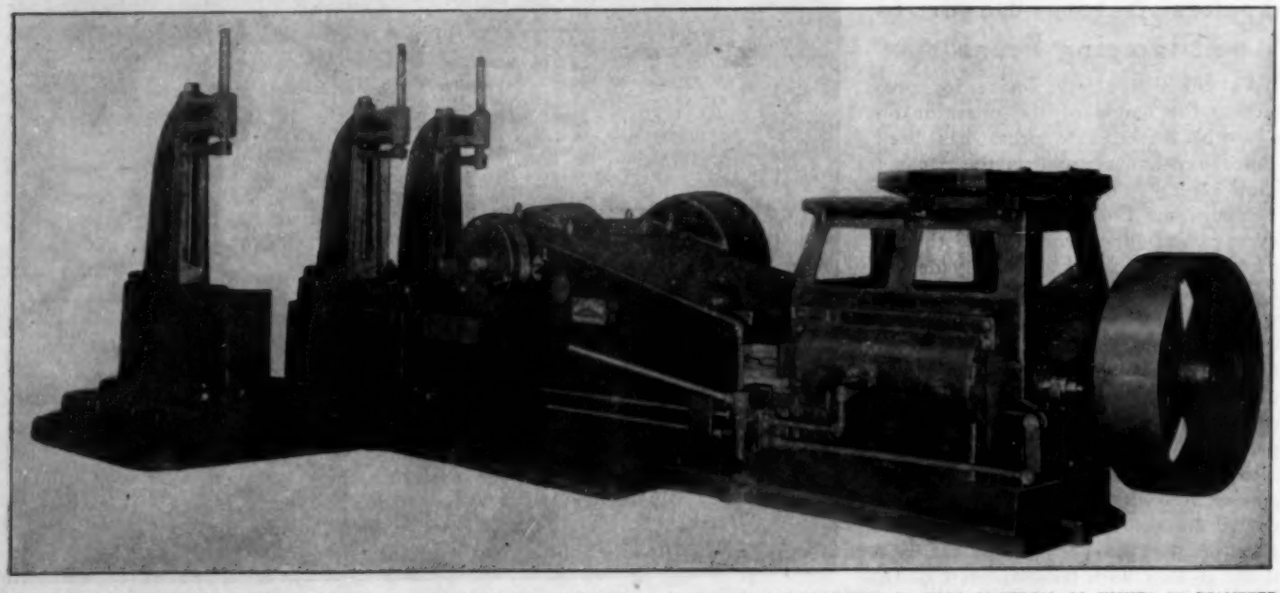
The miller runs at a constant pulley speed of 600 revolutions per minute and requires 5 to 7½ horsepower to operate. The gears are immersed in oil and completely enclosed. The driving pulley also is enclosed, meeting the safety regulations. The bearings are bronze bushed and the gears are cut from chrome nickel steel, except the large elevating bevel gear, which is cast.

A universal dividing head and vertical milling attachment of the semi-universal type complete the equipment which is adapted to a wide class of work. The dividing head gives all divisions up to 360 and the attachment permits as heavy a cut to be taken as on the horizontal spindle, the vertical spindle and bronze bearings being the same size as the main spindle.

New Cutoff Saw Handles Large Stock

One of the recent developments of the Newton Machine Tool Works, Inc., Philadelphia, is a cold saw for cutting large ingots and heavy forgings of 24-inch diameter stock in one cut. The machine is equipped with a 76-inch inserted tooth saw. A main work table, 56 inches long in the direction of the feed of the saw and 48 inches wide, is bolted to the machine base. A platen 60 inches long, 56 inches wide and 12 inches deep is bolted to the table and provides a clamping block 18 inches wide at the base and 12 inches wide at the top.

Two V-blocks fitted to the main work table and one to the platen are supplied with swivel arch clamps and are arranged to hold a piece 32 inches in diameter. The machine is driven from a belt-connected motor through a solid bronze worm wheel and hardened steel worm fitted with roller



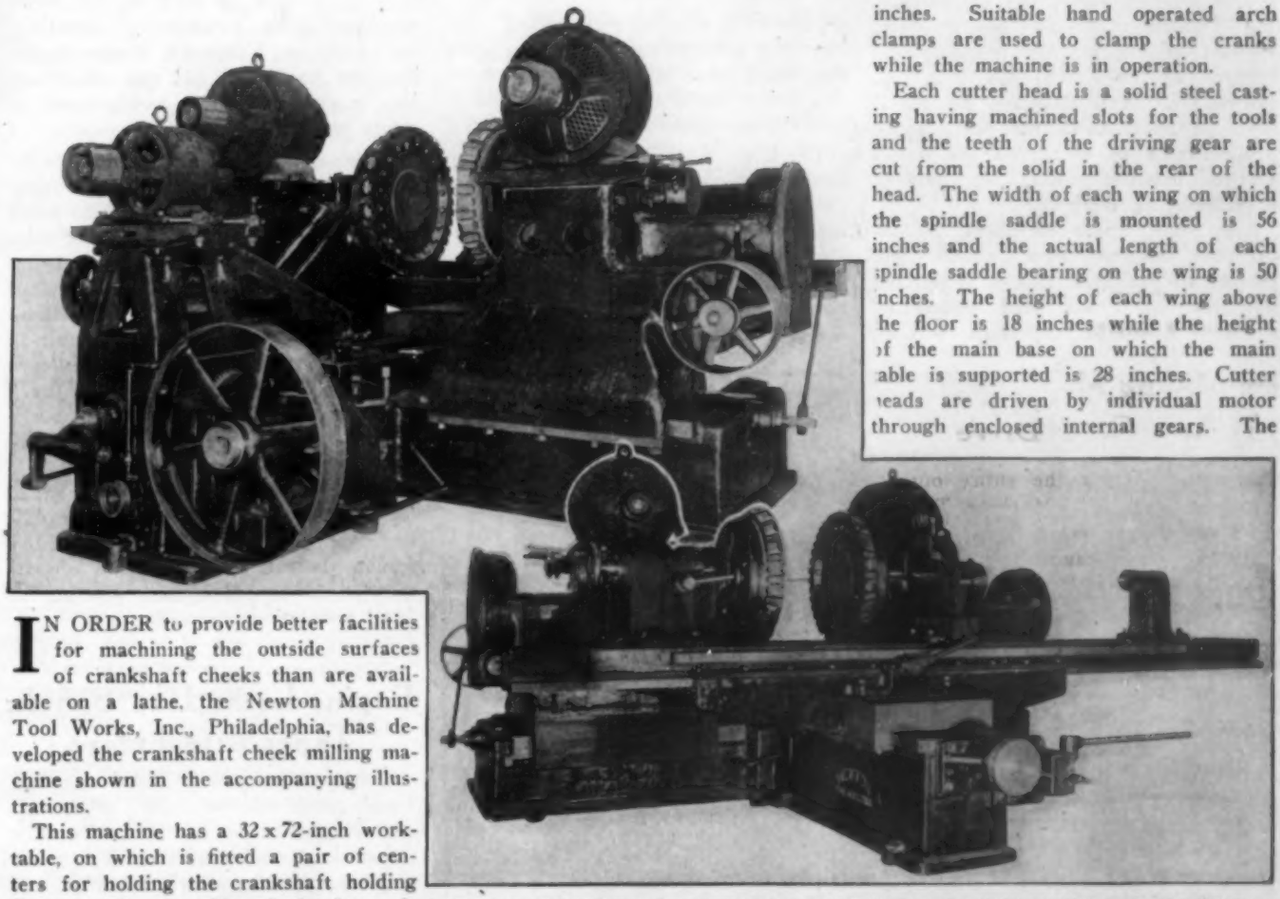
STOCK 24 INCHES IN DIAMETER IS SAWED BY THIS MACHINE—V-BLOCKS AND CLAMPS ARE DESIGNED TO HOLD MATERIAL 32 INCHES IN DIAMETER

thrust bearings and spur pinion with teeth cut in the solid shaft to the spindle. The worm wheel and thrust bearings run in oil. The feed motion is taken from the drive shaft through gears to the oil tight feed box in which the change gears are mounted on a sliding sleeve controlled by latch levers in the cover. From this box the motion is transmitted to the saddle feed screw through a feed worm and worm wheel which is positively clutched.

The machine is controlled from the rear. The forward feed and rapid traverse forward and back are provided with automatic stops. Curtain covers enclose the feed and traverse mechanism. A positive safety release is provided for each extreme position of traverse. An oil and chip pan cast on the base drains the lubricant back to the reservoir while a loose chip pan fitted between the tables drains to the oil pan on the base.

The Allis-Chalmers Mfg. Co., Milwaukee, has just completed the installation of the largest hydro-electric generating unit in the world for the Niagara Power Co., Niagara Falls, N. Y. The rated capacity is 37,500 horsepower, but in a test, the machine developed 41,000 horsepower, working under a 212-foot head at 1500 revolutions per minute. William M. White, general manager and chief engineer of the hydraulic department of the Allis-Chalmers company, gave an illustrated lecture on the mammoth installation before an open meeting of the Engineers' society of Milwaukee, on Feb. 5.

Designs New Miller for Crankshafts



MACHINE FOR MILLING THE CHEEKS OF CRANKSHAFTS—THIS UNIT CARRIES TWO MOTOR-DRIVEN, INSERTED-TOOTH CUTTERS THAT MILL BOTH SIDES OF THE CRANK SIMULTANEOUSLY

IN ORDER to provide better facilities for machining the outside surfaces of crankshaft cheeks than are available on a lathe, the Newton Machine Tool Works, Inc., Philadelphia, has developed the crankshaft cheek milling machine shown in the accompanying illustrations.

This machine has a 32 x 72-inch worktable, on which is fitted a pair of centers for holding the crankshaft holding fixture. The top side of the latter is adjustable crosswise by means of a rack and hand-operated pinion. This table has forward and reverse power traverse and hand adjustment, controlled by a revolving screw and a stationary nut. Six changes of gear feed to the table are obtained through sliding sleeves on which the gears are mounted in an oil-tight box. These sleeves are controlled by latch levers outside the cover. The main table has a 30-inch feed and hand adjustment along the base.

Each cutter head is 40 inches in diameter over the cutting tools and each cutter head saddle has independent hand adjustment on its wing. This permits the heads to operate within four inches of each other, with a maximum distance between cutters of 30 inches. On the top slide of the crankshaft holding fixture is a pair of centers for holding the crankshaft, the maximum distance between them being 15 feet. The right hand center is rigid and the left one has hand adjustment to permit its insertion into the centers of the crankshafts. Both centers are adjustable upon the top slide, and the distance from the top of the latter to the center of the center in which the crankshaft is placed is 11 inches. Suitable hand operated arch clamps are used to clamp the cranks while the machine is in operation.

Each cutter head is a solid steel casting having machined slots for the tools and the teeth of the driving gear are cut from the solid in the rear of the head. The width of each wing on which the spindle saddle is mounted is 56 inches and the actual length of each spindle saddle bearing on the wing is 50 inches. The height of each wing above the floor is 18 inches while the height of the main base on which the main table is supported is 28 inches. Cutter heads are driven by individual motor through enclosed internal gears. The table is driven by motor of interlocking control type, so that in stopping the table, the motor stops first and in the operation of starting the two driving motors for the cutter heads start first.

Among the bulletins recently issued by the United States geological survey is one entitled "Deposits of Manganese Ore in Costa Rica and Panama," by J. D. Sears. This paper gives the results of the examination of manganese deposits in Costa Rica and Panama. In Costa Rica the deposits are widespread,

but most of them are either of low grade or of small extent. In October, 1918, ore was being produced at only three of the deposits. Labor is cheap, and deposits of any reasonable size could be developed at moderate expense, but only one other group of prospects seems to be promising. The two deposits in Panama described are northeast of the canal zone and contain 25,000 to 30,000 tons of manganese ore. An assay of the ore from one deposit showed 55 per cent of manganese.

Designs Heavy Duty Vertical Miller

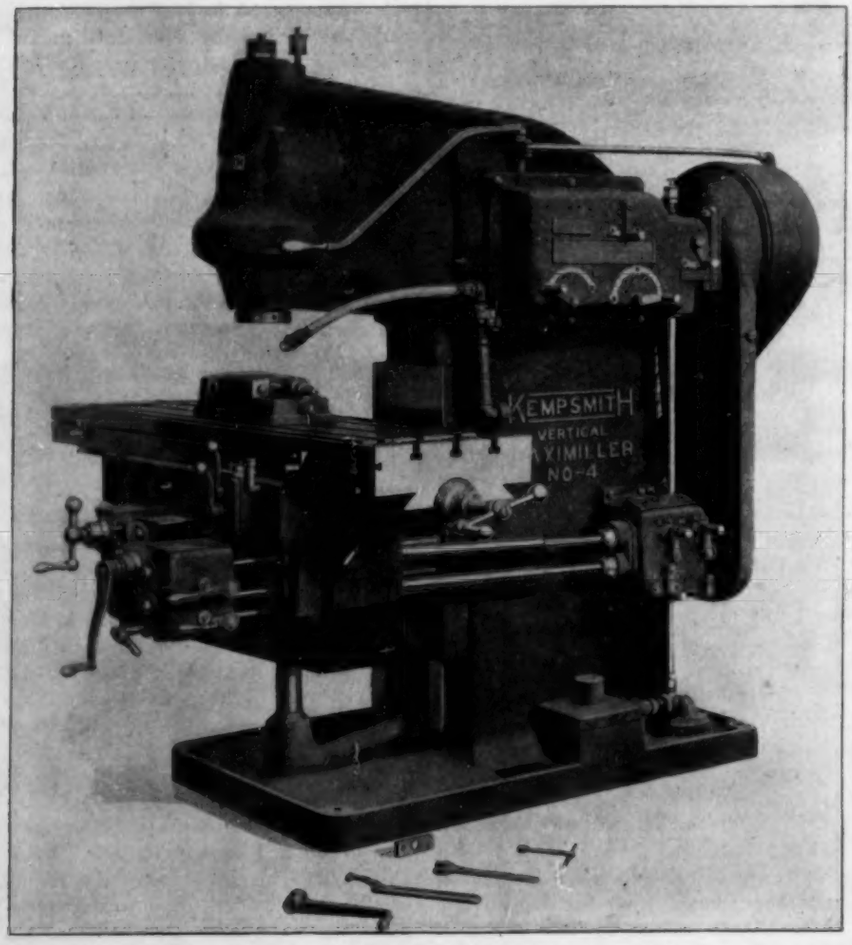
The tool shown in the accompanying illustration is a heavy duty, vertical milling machine recently developed by the Kempsmith Mfg. Co., Milwaukee. It is designed for maximum production, all the parts being proportioned to withstand the heavy strains brought about by modern manufacturing methods.

The main frame members, including the column, knee, saddle and platen, are semisteel and, it is pointed out, the metal has been distributed to give maximum strength without merely making a heavy machine. The knee has no openings at the top while the sides also are practically solid. The solid construction of this member compensates for table overhang.

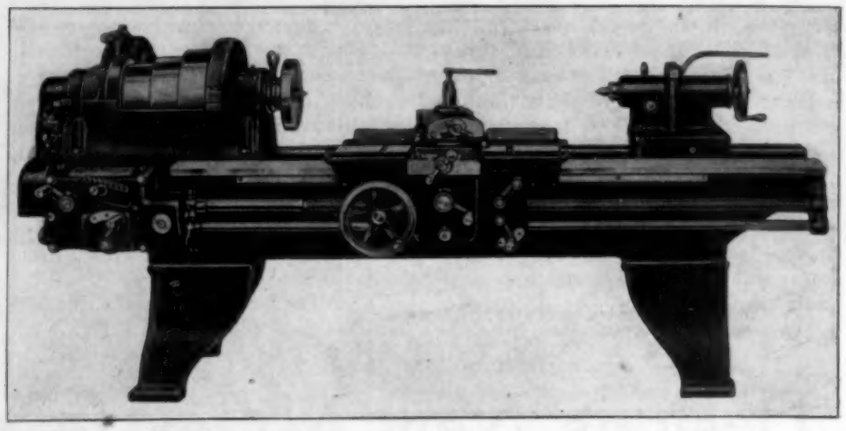
The knee, table and saddle are counterweighted by means of weights inside the column which makes lowering and raising of the platen an easy operation. The platen has a working surface of 18 x 70 inches and a longitudinal range of 42 inches. The spindle is substantial in design, accurately machined, and finished by grinding. Its nose is protected from undue wear by hardening. It will drive cutters in either direction and permits of ready removal of the cutters.

Slow speed shafts in the spindle train are large in proportion, made of heat-treated alloy steel. The bevel gears are heavy in design, of the spiral type. The machine is furnished either in right or left hand design. A pump with a capacity of 5 gallons per minute is provided. This unit is of the centrifugal type and delivers lubricant in a steady stream just over the cutters. Lubrication of the working parts is through the splash system.

This machine is regularly arranged for single pulley drive but can readily be equipped for motor drive through a belt. In this case the motor recommended is 15 horsepower running at 1200 revolutions a minute.



VERTICAL MILLING MACHINE DESIGNED FOR HEAVY DUTY



ENGINE LATHE DESIGNED FOR PRECISION WORK AND MAXIMUM PRODUCTION

Engine Lathe Has Simple Taper Attachment

Quick change feed facilities and a simple and efficient taper attachment are salient features of the engine lathe shown in the accompanying illustration, a product of the Morris Machine Tool Co., Cincinnati. The feed box gives a range of 45 changes of feed by means of levers at the operator's left, arranged for quick manipulation. The taper attachment is said to stand up under the most severe usage. It is graduated for rapid setting in degrees and in inches per foot. The maximum taper is 4 inches per foot. The range of tapered work handled is from 22 inches long on the 16-inch lathe to 25 inches on the 22-inch lathe.

This lathe is furnished in three sizes, 16, 18 and 22-inch swing, respectively. The bed is a box-shaped casting which carries the head stock, tailstock and carriage in the usual manner. All gears

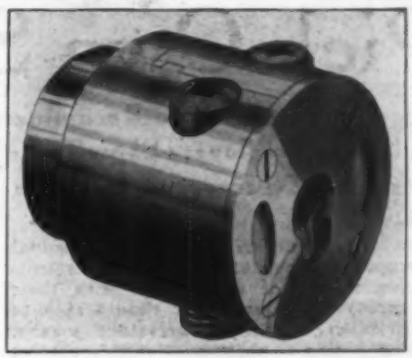
are cut while the spindle, tailstock quill, etc., are finished by grinding to insure accuracy.

Threads from 2 to 30 including 11½ can be cut without employing extra gears. All exposed gears are guarded while the operating mechanism of the apron is so designed that the carriage permits of easy manipulation.

Drill Chuck Boring Head Has Many Uses

A small drill chuck boring head recently designed by the Marvin & Casler Co., Canastota, N. Y., combines the features of two tools and can quickly be adjusted to perform the functions of either tool. It is equipped with two screws, as shown in the accompanying illustration, one for gripping the drill or boring tool and the other graduated to 1/1000 inch for controlling the offset. Drills, reamers, or counterbores with shanks up to ¼-inch can be chucked accurately.

The offset screw provides for an offset of 3/16 inch with either round



THIS TOOL CAN BE USED ON MILLING MACHINE, LATHE, DRILL OR TURRET LATHE

or hexagon boring tools up to 5/16 inch in diameter, and an offset of ½ inch with round or hexagon tools up to ¼ inch in diameter. The chuck boring head can be supplied with a taper shank and mounted on milling machines for drilling, reaming and boring holes to size in jig, fixture and gage work. Another use is that of undercutting and recessing when mounted in a turret lathe. This chuck is 3 3/16 inches long and 3 inches in diameter.

Proposes Decimal System

WASHINGTON, March 2.—Senator King, of Utah, has introduced by request a bill to establish standard and decimal divisions of the weights, measures and coins. The bill has been referred to the senate committee on standards, weights and measures, and it is not thought likely it will be given any consideration at the present session of congress, if at all. Senator Reed, chairman of that committee, is opposed to bills providing for a change in the standards of measurement from the existing English system.

The bill introduced by Senator King provides for a wholly different standard than that proposed by proponents of the metric system. It would establish the decimal system and retain the present foot, ounce, bushel and ton. A foot would be divided decimally into 10 decimal inches, 100 lines and 1000 points. The square of a decimal inch would be called a decimal square, and the decimal cube would be transferred into a unit of weight by making a decimal cube of water at maximum density an ounce.

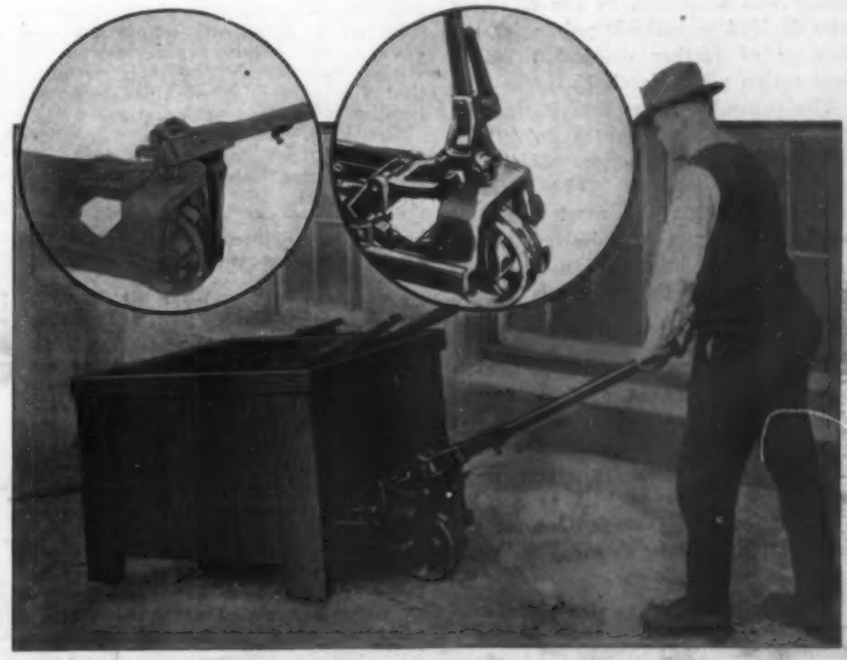
Proceeding from this basis 1000 points would equal one foot, 1000 grains one ounce, and 1000 ounces one weight unit. The point would be used for fine mechanical and scientific measures, and the grain for fine weights, while the ounce would be used for retail trade weights. The intention is that retail trade measurements be made in ounces rather than in pounds.

The two changes that would take place, if the bill were passed, would be the adoption of the point for fine mechanical measure, instead of fractions of the inch and millimeters, the point being much finer than the millimeter. The ounce would become the unit for retail trades, the present ounce being used.

The old common measures, including the common inch, are recognized and are not abrogated by the bill.

Designs Brake for Small Factory Trucks

For controlling the speed of the small three-wheel shop and factory trucks manufactured by the Cowan Truck Co., 712 Water street, Holyoke, Mass., the company has devised a simple brake attachment. As shown in the accompanying illustrations, the device consists of two parts, a small pendant swinging from a bracket on the truck handle and a brake band mounted over the top portion of the front wheel. When it is desired to operate the brake, the pendant is released from a spring clip which holds it flat against the handle and out of the way. As it swings down, it engages in a small casting mounted on the forward end of the spring steel brake band which has attached to it on the under side a strip of brake band fabric. Braking is accomplished by bearing down on the truck handle as a lever until the proper amount of resistance to travel is obtained. For work on a level surface the pendant is disengaged from the band by lifting up on the handle and is again secured in place by the clip.



A BRAKE CONTROLS TRUCK SPEED ON INCLINE. LEFT INSET SHOWS PENDANT IN BRAKING POSITION; RIGHT INSET SHOWS IT CLIPPED TO HANDLE

Let Labor Pick Own Spokesmen

Cleveland Chamber of Commerce Committee Recommends Principles for Industrial Relations—Would Have Employers Show Their Books to Prove Fairness of Wage Payments if Necessary—Declares for 8-hour Day

LABOR is given the right to select representatives of its own choosing in a declaration of principles for establishing a basis for proper labor relations in Cleveland adopted by the committee on labor relations of the Cleveland chamber of commerce. The right of employers to maintain the open shop, together with the right of employers and employes to agree on a closed shop, is upheld. It is declared that the working day should be limited to eight hours, with half holiday on Saturday. Public interest is pronounced paramount, and the public, it is stated, should not tolerate arbitrary suspension of industry or any form of violence.

The report of the committee was signed by 26 of the 30 members, including the heads of two transportation brotherhoods, the engineers and trainmen, the only organized labor men in the chamber. Among those who signed are a number of employers in the iron and steel industry and related manufacturing lines. The committee was at work on the subject for three months, although similar committees representing the chamber have been gathering material and discussing a report for four years. The report was submitted to the directors who decided to make it public for the purpose of further discussion before final action after March 15.

The preamble states that it was the purpose of the committee to submit a declaration of principles which the public would support. "The committee believes that the most powerful force to bring about desired conditions is the opinion of an informed and enlightened public," it is stated.

Offer to Act as Mediators

The declaration of principles calls for the establishment of "machinery" for the settlement of labor disputes but does not provide a definite plan, although the committee states it is willing to act on request as arbiter, or as a board of investigation for the information of the public. The declaration in part follows:

"Proper industrial relations are promoted by practical means of communication and negotiation between an employer and his employes. Where the channel of communication existing between an employer and the individual employe does not offer employes suitable means of negotiation with their employer, the employer should seek to establish mutually satisfactory means. For this purpose representative negotiation is advocated.

"Representative negotiation is defined as that form of collective bargaining which provides for negotiation between an employer and duly accredited representatives of his employes, regarding hours, wages and all other matter properly affecting their relationship. Employes' representatives should be duly accredited, be chosen by the employes from among their own number, unless otherwise agreed by employer and employes, and be empowered by the employes to negotiate for them. Such negotiation should be under control of the parties immediately concerned.

"When employes in any establishment desire to do so they should have the option of choosing, without restriction on the part of the employe, a competent adviser or advocate, to meet with representatives chosen by and from among the employes in negotiations with their employer. Representatives of employes, selected by and from among their own number, should be assured that no discrimination will be made against them by their employer because of anything said or done in their representative capacity.

"In those industries where an establishment cannot practically be the unit of representative negotiation, the principle of representative negotiation between a group of employers and groups of employes is advocated. Under such conditions it is essential that the principles of this document be applied wherever practicable.

"Nothing herein is intended to abrogate the right of an individual employe to negotiate directly with his employer.

"Employers and employes should uphold in their integrity all arbitration awards or agreements entered into between them.

"Freedom of contract of employment must never be impaired. However, employers should not discriminate in the employment or discharge of employes on the ground that they are, or are not, members of a trade or labor union.

"Employes should not arbitrarily insist that employment in any establishment be conditioned on membership or nonmembership in a trade or labor union.

"Nothing herein is intended to prevent the making of an agreement between an employer and his employes to maintain a closed union, or a closed nonunion shop or department, where both parties desire such an arrangement.

"Employers should recognize the need of informing their employes on the subject of business principles as affecting their mutual interests, especially the relation of wages and expense to costs and prices, and the necessity for an equitable return on invested capital. Frankness is advised on the part of employers in placing before their employes business details necessary to prove those economic facts. Employes should be equally frank in discussing with their employer matters affecting their conditions of employment and the interests of their industry. Such an attitude on the part of both employer and employe will tend to remove the barrier of suspicion and distrust which often is the cause of labor disputes, and establish a spirit of mutual interest and confidence.

"Violence, intimidation, ostracism, humiliation or blacklisting cannot be tolerated in labor relations on the part either of the employer or of the employes.

"Public sentiment should support all public officials enforcing fearlessly the laws in respect to the practices.

"The employes' right to strike and the employers' right to lockout his employes are both secondary to the public's right to service.

"Since the public interest is paramount, it follows that public opinion is, and should be, a potent influence for the settlement of labor disputes. Therefore, machinery should be set up to develop and crystallize this opinion according to established facts, and until these facts have been established neither party should resort to strike or lockout.

"In essential industries, government services and public utilities prompt settlement of disputes should be effected by the efforts of both parties. The public's right to uninterrupted service during the period of settlement is a primary consideration."

LABOR NOTES

The Bridgeport Brass Co., Bridgeport, Conn., has formed a class of 73 men to take a course in production methods which will be directed by the Business Training Corp., New York.

Electrical workers have been given an advance by most contractors of Trenton, N. J., the increase amounting to 18 cents an hour. They formerly received $1 an hour.

The Open Shop Association of Wausau, Wis., has been organized by the leading manufacturers of that city, who are conducting a campaign against radicalism through the press.

Ore Prices

With Premiums and Penalties Worked Out on 1920 Basis

With general prices of Lake Superior iron ore for 1920 established by the largest producers, and all the latter preparing to make heavy shipments, questions frequently are asked regarding premiums and penalties on ores not conforming to guarantees. The form of contract generally used specifies the method for determining prices when the natural iron or phosphorus in the ore delivered varies from certain standards, but in the accompanying tables, just issued in booklet form by M. A. Hanna & Co., Cleveland, premiums and penalties have been worked out on the basis of 1920 unit values, and prices may be read at a glance.

The unit value of the base ore is determined by adding 60 cents, an arbitrary amount to represent rail freight rate from Cleveland to furnaces in the Mahoning valley, to the market price of a ton of the base ores and dividing the total by 55, in the case of bessemer ore, or 51½ in the case of nonbessemer ore, these representing the guaranteed percentages of natural iron in the respective ores. For instance, old range bessemer ore is quoted at $7.45, delivered "at rail of vessel" at any Lake Erie port. The unit value is 14.636 cents. The valley furnace buying the base ore must pay $7.45, and, in addition, freight to its furnace, while the lake furnace need not pay such freight. When the unit value is determined, however, the freight rate is included in the calculation, and the lake furnace must pay for "off grades" of iron on that basis. The valley furnace also must pay for the ore on the same basis, and in addition, the cost of transporting it from the dock to the furnace. From 50 to 75 per cent of the ore shipped is below the guarantee, and a high unit value automatically operates to reduce the price proportionately. The penalties and premiums are based on sliding scales as shown in the tables.

For determining premiums or penalties on the phosphorus in bessemer ores the phosphorus table is used. The base grade of ore contains .045 per cent phosphorus dried. If the amount of phosphorus should exceed that, the corresponding phosphorus value is deducted from the price of the ore as previously determined, while if it is less, a corresponding premium is paid.

Edward Murphy, owner of the Northampton Iron Works, Florence, Mass., has purchased the old foundry building of the Florence Co. in that town and will remodel it.

Prices of Lake Ores for 1920

Old Range Bessemer

BASE PRICE, $7.45 AT LAKE ERIE PORT. GUARANTEE 55.00 PER CENT IRON NATURAL; .045 PER CENT PHOSPHORUS DRIED

					Lake Erie Unit Value	Lake Erie Value
For 61.00%	Iron	Natural	Unit Value	60-61%	.14636	8.48
For 60.00%	Iron	Natural	Unit Value	59-60%	.19636	8.33
For 59.00%	Iron	Natural	Unit Value	58-59%	.18636	8.14
For 58.00%	Iron	Natural	Unit Value	57-58%	.17636	7.95
For 57.00%	Iron	Natural	Unit Value	56-57%	.16636	7.77
For 56.00%	Iron	Natural	Unit Value	55-56%	.15636	7.61
For 55.00%	Iron	Natural	Base Ore		.14636	7.45
For 54.00%	Iron	Natural	Unit Value	54-55%	.14636	7.30
For 53.00%	Iron	Natural	Unit Value	53-54%	.14636	7.16
For 52.00%	Iron	Natural	Unit Value	52-53%	.14636	7.01
For 51.00%	Iron	Natural	Unit Value	51-52%	.14636	6.86
For 50.00%	Iron	Natural	Unit Value	50-51%	.14636	6.72
For 49.00%	Iron	Natural	Unit Value	49-50%	.21954	6.50
For 48.00%	Iron	Natural	Unit Value	48-49%	.20272	6.31
			Below	48%	.29 per unit	

Mesabi Bessemer

BASE PRICE, $7.20 AT LAKE ERIE PORT. GUARANTEE 55.00 PER CENT IRON NATURAL, .045 PER CENT PHOSPHORUS DRIED

For 61.00%	Iron	Natural	Unit Value	60-61%	.14182	8.20
For 60.00%	Iron	Natural	Unit Value	59-60%	.19182	8.06
For 59.00%	Iron	Natural	Unit Value	58-59%	.18182	7.87
For 58.00%	Iron	Natural	Unit Value	57-58%	.17182	7.69
For 57.00%	Iron	Natural	Unit Value	56-57%	.16182	7.51
For 56.00%	Iron	Natural	Unit Value	55-56%	.15182	7.35
For 55.00%	Iron	Natural	Base Ore		.14182	7.20
For 54.00%	Iron	Natural	Unit Value	54-55%	.14182	7.06
For 53.00%	Iron	Natural	Unit Value	53-54%	.14182	6.92
For 52.00%	Iron	Natural	Unit Value	52-53%	.14182	6.77
For 51.00%	Iron	Natural	Unit Value	51-52%	.14182	6.63
For 50.00%	Iron	Natural	Unit Value	50-51%	.14182	6.49
For 49.00%	Iron	Natural	Unit Value	49-50%	.21273	6.28
For 48.00%	Iron	Natural	Unit Value	48-49%	.28364	5.99
			Below	48%	.285 per unit	

Mesabi Nonbessemer

BASE PRICE, $6.55 AT LAKE ERIE PORT. GUARANTEE 51.50 PER CENT IRON NATURAL

For 61.00%	Iron	Natural	Unit Value	60-61%	.13883	7.87
For 60.00%	Iron	Natural	Unit Value	59-60%	.13883	7.73
For 59.00%	Iron	Natural	Unit Value	58-59%	.13883	7.59
For 58.00%	Iron	Natural	Unit Value	57-58%	.13883	7.45
For 57.00%	Iron	Natural	Unit Value	56-57%	.13883	7.31
For 56.00%	Iron	Natural	Unit Value	55-56%	.13883	7.17
For 55.00%	Iron	Natural	Unit Value	54.55%	.13883	7.04
For 54.00%	Iron	Natural	Unit Value	53.54%	.13883	6.90
For 53.00%	Iron	Natural	Unit Value	52-53%	.13883	6.76
For 52.00%	Iron	Natural	Unit Value	51.50-52%	.13883	6.62
For 51.50%	Iron	Natural	Base Ore		.13883	6.55
For 51.00%	Iron	Natural	Unit Value	51-51.50%	.13883	6.48
For 50.00%	Iron	Natural	Unit Value	50-51%	.13883	6.34
For 49.00%	Iron	Natural	Unit Value	49-50%	.20825	6.13
For 48.00%	Iron	Natural	Unit Value	48-49%	.27766	5.86
			Below	48%	.28 per unit	

Old Range Nonbessemer

BASE PRICE, $6.70 AT LAKE ERIE PORT. GUARANTEE 51.50 PER CENT IRON NATURAL

For 61.00%	Iron	Natural	Unit Value	60-61%	.14175	8.05
For 60.00%	Iron	Natural	Unit Value	59-60%	.14175	7.90
For 59.00%	Iron	Natural	Unit Value	58-59%	.14175	7.76
For 58.00%	Iron	Natural	Unit Value	57-58%	.14175	7.62
For 57.00%	Iron	Natural	Unit Value	56-57%	.14175	7.48
For 55.00%	Iron	Natural	Unit Value	54-55%	.14175	7.20
For 55.00%	Iron	Natural	Unit Value	54-55%	.15175	7.20
For 54.00%	Iron	Natural	Unit Value	53-54%	.14175	7.05
For 53.00%	Iron	Natural	Unit Value	52-53%	.14175	6.91
For 52.00%	Iron	Natural	Unit Value	51.50-52%	.14175	6.77
For 51.50%	Iron	Natural	Base Ore		.14175	6.70
For 51.00%	Iron	Natural	Unit Value	51-51.50%	.14175	6.63
For 50.00%	Iron	Natural	Unit Value	50-51%	.14175	6.49
For 49.00%	Iron	Natural	Unit Value	49-50%	.21262	6.27
For 48.00%	Iron	Natural	Unit Value	48-49%	.28350	5.99
			Below	48%	.285 per unit	

Phosphorus Table

Percentage of phosphorus	Rate of progression	Phosphorus values	Percentage of phosphorus	Rate of progression	Phosphorus values	Percentage of phosphorus	Rate of progression	Phosphorus values
.060	.0150	.1725	.041	.0095	.0350	.022	.0190	.3105
.059	.0145	.1575	.040	.0100	.0450	.021	.0195	.3300
.058	.0140	.1430	.039	.0105	.0555	.020	.0200	.3500
.057	.0135	.1290	.038	.0110	.0665	.019	.0205	.3705
.056	.0130	.1155	.037	.0115	.0780	.018	.0210	.3915
.055	.0125	.1025	.036	.0120	.0900	.017	.0215	.4130
.054	.0120	.0900	.035	.0125	.1025	.016	.0220	.4350
.053	.0115	.0780	.034	.0130	.1155	.015	.0225	.4575
.052	.0110	.0665	.033	.0135	.1290	.014	.0230	.4805
.051	.0105	.0555	.032	.0140	.1430	.013	.0235	.5040
.050	.0100	.0450	.031	.0145	.1575	.012	.0240	.5280
.049	.0095	.0350	.030	.0150	.1725	.011	.0245	.5525
.048	.0090	.0255	.029	.0155	.1880	.010	.0250	.5775
.047	.0085	.0165	.028	.0160	.2040	.009	.0255	.6030
.046	.0080	.0080	.027	.0165	.2205	.008	.0260	.6290
.045	.0000	.0000	.026	.0170	.2375	.007	.0265	.6555
.044	.0080	.0080	.025	.0175	.2550	.006	.0270	.6825
.043	.0085	.0165	.024	.0180	.2730	.005	.0275	.7100
.042	.0090	.0255	.023	.0185	.2915			

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE Aetna Machinery Corp., Newark, N. J., originally incorporated with a capital stock of $10,000, increased this to $100,000 recently. Its principal offices and warehouses are located at 15 Mechanic street, Newark, but the additional capital was arranged for the purpose of enabling it to erect a modern 1-story concrete building, equipped with a 25-ton traveling crane for the handling of new and used machinery. A machine shop to be erected for the rebuilding of used machine tools will be equipped with a 16-foot planer, a 42-inch boring mill, 16 and 24-inch shapers, 36-inch drill, universal milling machine and lathes. This company has plans completed on and soon will offer to the trade several machines of its own make. These include a back-geared Fox Monitor lathe, a back-geared crank shaper with V ram in three sizes, 16, 20 and 24-inch respectively, and a hand surface grinder.

* * *

OFFICES have been opened by D. H. Hauenstein at 90 West Broadway, New York, to do a general brokerage business in iron and steel products. Mr. Hauenstein until recently served as eastern advertising representative of *Daily Iron Trade and Metal Market Report*. He has a wide acquaintance in iron and steel circles in all parts of the country.

* * *

ANOTHER addition is being built to the plant of the American Steel Co. at Ellwood City, Pa. This addition, which will be 43 x 150 feet, will contain machinery for making wire and wire nails. The company also is planning at an early date to construct a building for the housing of the strip steel mill purchased some time ago but never installed.

* * *

THE Cleveland Steel Supply Co., Cleveland, C. E. Schnibbe, manager, which was organized in March, 1919, has been made agent in the Cleveland district for the Erie Crucible Steel Co., Erie, Pa. Mr. Schnibbe ended a 12-year service with the Halcomb Steel Co., when he organized his own company about a year ago. He was Cleveland salesman for the Halcomb company for five years.

* * *

MACHINERY necessary for the manufacture of automatic soda fountains, etc., will be purchased by the Automatic Soda Fountain Corp., Norfolk, Va., which will erect a 3-story plant 100 x 100 feet. This plant will be of brick and concrete according to an announcement by James E. Woodhouse, president of the Benwood Finance Corp., Haddington building, Norfolk.

* * *

TWO lines have been added by F. S. Eggleston Jr., New England representative for the Keller Pneumatic Tool Co., Chicago; Cincinnati Electric Tool Co., Cincinnati; Detroit Hoist & Machine Co., Detroit, and the Cleveland Steel Tool Co., Cleveland. These are the R. G. Haskins Co., Chicago, flexible shaft equipment and the Hardsoeg Wonder Drill Co., Ottumwa, Iowa, steel rock drills and similar equipment.

* * *

INCORPORATED at $20,000, the Permanent Tool & Mfg. Co., Dayton, O., has a plant in course of erection which will be ready for occupancy about March 15. It will manufacture dies, jigs and fixtures. Equipment including lathes, milling machines and drills, has been ordered. E. W. Kramer is president; J. H. Horstman, vice president, and A. B. Horstman, secretary and treasurer.

* * *

THE Somerfield Mining Co. which recently took over the holdings of the Somerfield Fuel Co., Somerfield, Fayette county, Pa., has been granted a charter. Thomas R. Heyward Jr., of the Thomas R. Heyward Co., Pittsburgh, is president of the new company; Herman Kammerer of Morgantown, W. Va., vice president, and Samuel E. Coe, of the Thomas R. Heyward Co., secretary and treasurer. The new owners plan extensive improvements on the property.

* * *

A NEW plant is to be built for the Northwest Foundries, Inc., Rochester, N. Y., on the site of the present plant. The new building will be 197 feet by 250 feet, part one and part 2-story. It will be equipped for work in brass, aluminum and gray iron. The company was organized in 1912 as the Northwest Aluminum & Brass Foundry, and a year later the name was changed to the present one. Charles E. Tepper is president of the company.

* * *

WITH Ernest H. Cornelius as president, the Oklahoma Steel Castings Co., Tulsa, Okla., recently was incorporated with a capital of $100,000. A site has been purchased as has the major portion of the required equipment and building contracts will be let in the near future. The company will manufacture acid steel castings, particularly for the oil industry. Mr. Cornelius also is president of the Industrial Construction Co., Tulsa.

* * *

LOCATED at 315-323 Poston drive, the new plant of the H. & D. Co., Inc., Crawfordsville, Ind., will be 60 x 200 feet. The company recently was incorporated at $100,000 to manufacture shock absorbers and other auto accessories, and officers have been elected as follows: President, D. M. Peck; vice president, George H. Fosdick; secretary, Chase M. Harding; and treasurer, J. M. Kerr. Directors include the above with I. C. Elston.

* * *

THE consolidation of the Atlanta, Ga., and Greenville, S. C. plants of the American Machine & Mfg. Co. has been completed. The only manufacturing plant now operated by this corporation is located in Atlanta, although branch offices are scattered over the United States. This plant now comprises a machine shop, foundry, warehouse and general office, with a floor space of approximately 80,000 square feet. During the war the company manufactured shells for the government and now manufactures oil mill machinery of all kinds, giving special attention to machinery for extracting oil from cotton seed, peanuts, copra and other seeds. Representatives recently have been sent to Japan, China, India and the Philippines to establish agencies, and it is also planned to further extend the company's export business to South American countries as well.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE F. C. Austin Machinery Co., Railway Exchange building, Chicago, has been incorporated, a merger of three companies, representing the F. C. Austin Co., Inc., the Municipal Engineering & Construction Co., and the Muskegon, Mich., plants of the Linderman Steel & Machine Co. It retains the personnel of the several companies combined efforts of which now are being directed toward supplying the demand for earth-loading and cement-working machines formerly produced by the F. C. Austin Co., Inc. F. C. Austin has retired from active management and the president of the Linderman company, B. A. Linderman, has assumed control.

* * *

UNDER a Dominion of Canada charter, the Gotfredson-Joyce Corp., Ltd., Walkerville, Ont., has been incorporated with a paid up capital of $100,000 to build trucks for Canadian domestic and export trade. A building located in Walkerville, has been leased and operations are expected to commence at once. Officers follow: President, Benjamin Gotfredson; vice president, Robert B. Gotfredson, secretary and treasurer, Frank H. Joyce.

* * *

THE Valley Iron Works, Appleton, Wis., which doubled the size of its foundry and machine shop in the war to turn out marine engines for the Emergency Fleet corporation, is erecting further additions which will increase the capacity about 50 per cent. The extensions will be made in order to meet the demand for the company's ordinary line of paper mill machinery. Some additional foundry and machine shop equipment is being placed.

* * *

ALTHOUGH the Braddock Mfg. Co. last November sold its plant at Braddock, Pa., to the Wilson-Snyder Mfg. Co., Pittsburgh, it has not yet surrendered its charter and retains all other assets. Whether the company will remain in business is something that is yet to be decided. W. E. Troutman, president of the company, and R. W. Tener, treasurer, retired upon the consummation of the sale, while F. C. Sullivan, vice president and engineer of the company, retired on March 1. H. L. Campbell and F. B. McConnell, the other officers of the company, now are identified with the Wilson-Snyder company.

* * *

THE Alemite Die Casting & Mfg. Co. which has three smaller plants in Chicago, has bought a site at Washtenaw and Belmont avenues, in Chicago, on which it will build a plant containing about 100,000 square feet of floor space and which will cost about $400,000. The product is die and mold castings and automobile accessories. The smaller plants will be continued in service until 1922, when present leases expire. John S. Gullberg is president.

* * *

UNDECIDED as to what type of building it will erect, the Reliance Motor Truck Co., Appleton, Wis., is in the market for all kinds of machine tools, everything from drill presses to turret lathes and grinding machines. It originally intended to erect a 4-story manufacturing building but also is considering a 1-story sawtooth type building. The equipment required will depend upon the type of building it finally decides to construct as an addition to its present plant.

* * *

AT THE recent annual meeting of the Elyria Iron & Steel Co., Cleveland and Elyria, O., the following board of directors was elected: Hugh B. Wick, Myron A. Wick, George F. White, William T. Bentz, Walter Ferrier, F. R. Guyon and George C. W. Klippel. This board subsequently elected the following officers: President, Hugh B. Wick; vice president, Myron A. Wick; secretary-treasurer, George F. White and assistant treasurer, George C. W. Klippel.

* * *

THE business of the Nazel Engineering & Machine Works, 4041-4051 North Fifth street, Philadelphia, manufacturer of pneumatic power hammers, will be continued by the estate of the late John Nazel. It will be under the management of his sons Ralph W. and J. Milton Nazel, assisted by C. H. Wackernagel, all of whom have been actively identified with the business for a number of years. The latter was associated with John Nazel for about 16 years.

* * *

AS SOON as completed, the new plant of the Schartow Mfg. Co., in South Milwaukee, will be used as the company's main plant and the Racine, Wis., plant will be discontinued. The plant will be 90 x 300 feet of steel and brick construction with a sawtooth roof and will be used to manufacture saddlery hardware, harness chains and automobile accessories. Most of the equipment will be removed to the new plant from Racine, although new japanning ovens, line shafting and tin plating apparatus will be purchased.

* * *

DON F. KENNEDY, 1257 David Whitney building, Detroit, has added the Michigan agency of the Union Electric Steel Co., Pittsburgh, manufacturer of tool and alloy steels. The company now is producing ingots and billets and is installing a large conversion plant which soon will enable it to produce finished bars, die blocks and steam hammer forgings. Mr. Kennedy also is handling in Michigan and in Toledo, O., a gasoline industrial tractor made by the Towmotor Co., Bliss road, Cleveland.

* * *

WITH 48 acres of floor space, the new plant of the Cadillac Motor Car Co., Detroit, subsidiary of the General Motors Corp., which is being erected at Clark and Michigan avenues, is intended to be the most thoroughly equipped motor car plant in the world. Eight buildings comprising the group will be four stories in height with foundations for two additional stories on each as needed. These are going up on a 46-acre site served by the main line of the Michigan Central railroad and the Lake Shore & Michigan Southern. The duPont Engineering Co., of Wilmington, Del., has the general construction contract. The manufacturing building is 600 x 800 feet, with 970,000 feet of floor space. The heat treating building will be 80 x 500; assembly building 360 x 800; storage building, 140 x 480, and the administration building, 50 x 250 feet. In addition there will be a power plant, an oil storehouse and scrap metals storage building.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

AN INCREASE in capital stock has been arranged for the Wheeling Machine Products Co., formerly the Wheeling Machine & Welding Co., Inc., Twentieth and Main streets, Wheeling, W. Va., to provide for expansion. It intends to build a manufacturing department devoted entirely to the making of general screw machine products such as cap screws, cylinder and mold studs, ring posts, etc. Its general machine shop and supply department will continue uninterrupted and under the same management. The company is interested in receiving bids for all machinery necessary to equip a modern automatic screw machine department. A. C. Kennen is secretary.

* * *

ADDITIONS are being erected to the plant of the Dixie Brass & Foundry Co., Birmingham, Ala. The company also is erecting a gray iron foundry, which will be in charge of Rudolph Wegelin.

* * *

PRACTICALLY all of the equipment needed for alteration work now being done to the plant of the Jenkins Machine Co., Sheboygan, Wis., was ordered several weeks ago. A few small orders soon are to be placed.

* * *

THE new plant of the Industrial Heating Mfg. Co., East Mentor, O., just completed, is equipped to do sheet metal work, and manufacture japanning and enameling ovens, and heat-treating furnaces. It maintains an office at 1019 Citizens building, Cleveland.

* * *

DAMAGE to the extent of $40,000 was suffered by the Chalmers Pump & Mfg. Co., Lima, O., because of a fire on Feb. 22. The loss was entirely covered by insurance and the company announces it will rebuild a foundry immediately which will have double the capacity of the old one.

* * *

THE Eastern Brass & Ingot Corp., of New York, Waterbury, Conn., has added a new department to its business. It now supplies cast ingots according to analyses. It states iron and other foreign substances are eliminated from its cast ingots by putting the chips through intensive purification processes, the same used for making briquet ingots.

* * *

STOCKHOLDERS of the Ohio Generator Co., one of the newer industrial organizations of Wheeling, W. Va., have completed organization through the election of the following officers: President and general manager, E. M. Rodebaugh; vice president, Peter Boyd; secretary, George S. Houston; treasurer, E. Harland Rose.

* * *

EQUIPPED with automatic machinery, the Furber Mfg. Corp., Lynn, Mass., will manufacture spark plugs and other automotive equipment. It is the intention of the company to build or acquire a larger plant in the near future. Frederick Furber is president; Roland T. Parker is vice president and sales manager and Harry Eisner is treasurer.

* * *

BUILT up during the war, the line of steel pulleys and tackle equipment produced by the Union Hardware Co., Torrington, Conn., now has become a permanent department of the organization. The demand for these products steadily has increased since the armistice, and form an important part of the company's business.

* * *

THE Steel Sales Corp., 129 South Jefferson street, Chicago, has bought 35 acres at Crawford avenue and Thirty-fifth street, on which it will build a warehouse costing about $1,000,000, the first unit being 400 x 600 feet, of steel construction. The complete plant will have about 40 acres floor space.

* * *

THE G. E. Hoagland Foundry Co., Gardner, Mass., brass and gray iron castings, now owned by Marcus A. Coolidge, Fitchburg, Mass., president of the Fitchburg Machine Works, is to erect two additional buildings in the spring. The plans call for a casting building, 80 x 100 feet, and a cleaning and grinding building, 40 x 120 feet. A new 48-inch cupola also will be installed. A five-ton traveling crane has been installed to enable loading directly from the foundry to the cars. When completely equipped, the plant will furnish castings for the Universal Grinding Co., Fitchburg, P. W. V. Automatic Machine Corp., the Neilsen Mailing Machine Co., and the A. D. Weymouth Lathe Co.

* * *

THE Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass., held its annual meeting, Feb. 18, and elected the following officers: President and general manager, Charles E. Hildreth; treasurer, Ernest H. Clary; clerk, Jeremiah J. Macklin, South Boston, Mass.; directors, the officers and Albert E. Newton, Worcester, Robert C. Morse and Joseph W. Lund, both of Boston.

* * *

WITH orders placed for all needed equipment, the Watts Laundry Machinery Co., St. Joseph, Mich., intends to build a new factory this coming summer. It recently was incorporated at $20,000 and has an office and plant at St. Joseph. T. J. Watts is president and general manager; J. Brennan is vice president; P. Lynch, secretary, and E. P. Barry, treasurer.

* * *

THE new steel foundry being built for the Erie Forge Co., Erie, Pa., will have a monthly capacity of 3000 tons of basic and acid open-hearth steel. A separate unit also is being installed for small castings to be produced by the converter process. This plant will be equipped to produce any alloy steel casting weighing from four ounces to 60 tons.

* * *

ACTUAL work in the manufacture of an improved cotton chopper-cultivator has started at the new plant recently erected in Atlanta, Ga., by the Lanham Cotton Cultivator Co. The steel framework of the factory proper is almost finished and the principal machine shops recently were roofed. The woodworking building is entirely completed and patternmakers are at work in the foundry. The Lanham company recently purchased a large stock of machinery and mill supplies and this has just been delivered and is being installed. While the purchase was a large one it represents only a small part of the machinery that is to be installed in the new plant when it is entirely completed.

Obituaries

PETER SOMMER, founder and vice president of the Keystone Steel & Wire Co., Peoria, Ill., died recently at St. Petersburg, Fla., where he had been spending the winter. The Keystone plant was founded in a little shop on a farm near Tremont, Ill., in 1889. In 1892 the plant was removed to Tremont and in 1895 to Peoria. Mr. Sommer in youth learned the trade of a wagonmaker and erected the first piece of fence which was the basis of the present Keystone plant.

George Cleveland Hicks, director and executive of the Sefton Mfg. Corp., died Feb. 25, at Chicago.

George B. Kennington, formerly superintendent of the Pittsburgh Brass Co., Pittsburgh, died Feb. 22 at the West Penn hospital, Pittsburgh.

Sewell Franklin Belknap, secretary and treasurer of R. J. Mercur & Co., Ltd., Montreal, Que., died Feb. 22, in that city.

John N. Woodfin, president of the Lincoln Iron Works, Rutland, Vt., builder of stone working machinery, died at his home in that city, Feb. 23, aged 71 years.

Seymour Pierce, mechanical engineer for the Standard Metalworks Co., Thompsonville, Conn., died recently at his home in that town, aged 33 years.

Luther B. Weissbrod, for the past two years employment manager of the Goodell-Pratt Co., Greenfield, Mass., died suddenly in that town recently, aged 44 years.

George L. Smith, 84, head of the sheet metal house of George L. Smith Co., 108 East Liberty street, Louisville, Ky., died recently, following a short illness.

William Sobey, aged 70 years, an inventor and for many years vice president and general manager of the J. I. Case Plow Works, at Racine, Wis., died Feb. 23, at Dallas, Tex.

Edward L. Cevasco, aged 26, associated with his father in the machinery manufacturing firm of Cevasco, Cavagnao & Ambrette, Brooklyn, died of pneumonia at his home in that city recently.

J. J. Ryan, secretary to President Eugene W. Pargny of the American Sheet & Tin Plate Co., Pittsburgh, died at his home in Swissvale, Pa., last week following a brief illness of influenza-pneumonia.

Daniel R. Shuler, for many years connected with the National Tube Co., Pittsburgh, and one of the founders of a smaller Pittsburgh tubular company, died at his home in Pittsburgh, Feb. 21. He was a native of Hampshire county, W. Va.

George B. Distler, 37, formerly a chemist in the laboratory of the Youngstown Sheet & Tube Co., Youngstown, O., died at his home in Pittsburgh recently. He was a graduate of the University of Pittsburgh, and at one time had been engaged in the drug business.

Lewis M. McCallum, assistant manager and sales representative for M. S. Brooks & Son, Chester, Conn., makers of wire goods, who for more than 25 years was engaged in the wire goods business in Worcester, Mass., died at his home in Chester, Feb. 23, aged 45 years.

George Bruce Fessenden, founder and president of the Ero Magnetic Clock Co., Boston, died at his home in that city, Feb. 17, aged 84 years. He was the inventor of the Boston magneto and portable watchman's clocks and other devices and in 1888 organized the company to make them.

Col. J. D. Platt, one of Dayton's best known figures in the iron and steel trade died recently. He was former president of the Barney & Smith Car Co. and founder of the Platt Iron Works, with which he was identified at the time of his death. He was 83 years old.

John H. Bennett, proprietor of the Bay State Stamping Co., Worcester, Mass., and founder of the metal stamping industry in that city, died at his home in Worcester, Feb. 22, of pneumonia, aged 74 years. He started in business in Worcester in 1888.

Hardy Greenwood, Dallas, Tex., sales agent of the Youngstown Sheet & Tube Co., Youngstown, O., since its organization, died at Watertown, N. Y., where he was visiting recently, following an illness of about a month. Mr. Hardy had come north to attend the annual sales convention of the Youngstown Sheet & Tube Co., Jan. 8 and 9, going to Watertown to spend a few days before the opening of the convention. He was a native of New Orleans and about 45 years old. At one time he was the Dallas sales agent of the Youngstown Sheet & Tube Co., the Republic Iron & Steel Co. and the Lukens Steel Co., but with the expansion in the number of products of the Youngstown Sheet & Tube Co. he gave up the agencies of the other companies.

C. D. Hine, attorney and member of the board of directors of the Youngstown Sheet & Tube Co., Youngstown, O., died Feb. 22, in Pasadena, Cal. Following his failure in health some time ago, he spent his winters in California. He was the senior member of the law firm Hine, Kennedy & Manchester.

George W. Herrick, president of the Herrick Co., Boston, wholesale metals, died at his home in Malden, Mass., recently, aged 78 years. He went to Boston in 1870, and after seven years with May & Co., shared in the organization of the Holder & Herrick Co., which developed into the Herrick Co. in 1904.

Henry Russel, vice president and general counsel of the Michigan Central railroad, director and stockholder in several of Detroit and Michigan's largest industries, died in the Ritz Carlton hotel, New York, Feb. 25 of pneumonia and gastritis, aged 68 years. Walter S. Russel, president of the Russel Wheel & Foundry Co., and John R. Russel, president of the Great Lakes Engineering Works, are brothers.

Henry A. Porterfield, 56, for many years owner and manager of the Dexter Oil Co., Pittsburgh, but formerly connected with the Cambria Iron Co., Johnstown, Pa., and later with the Carnegie Steel Co., died recently at the Duquesne club, Pittsburgh, after a brief illness. He was born in Emlenton, Pa., and was graduated from Lehigh university in the class of 1883. He was engaged as a mining engineer in the coal regions near Wilkes-Barre, Pa., following the completion of his college course and after some years with the Cambria Iron Co., came to Pittsburgh and organized the chemical department of the Edgar Thomson works of the Carnegie Steel Co.

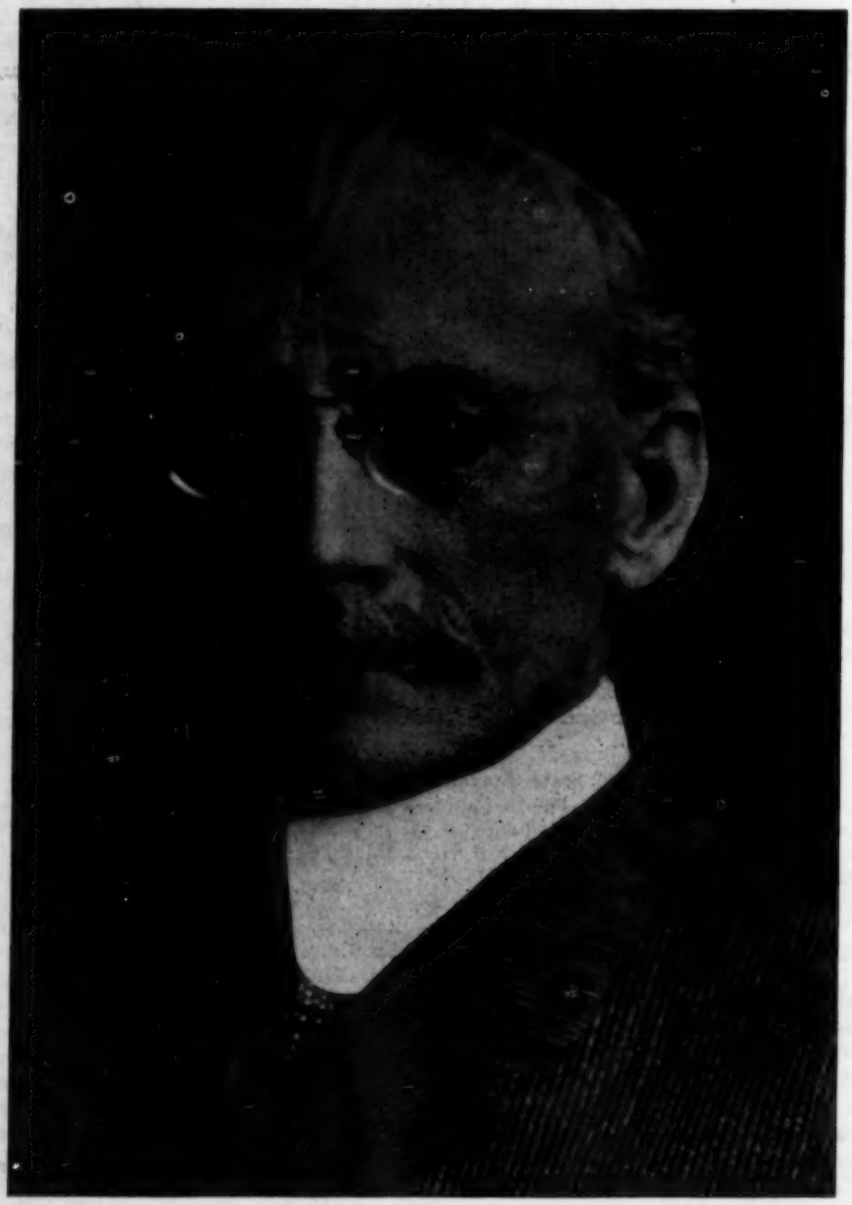
James Gayley

Oct. 11, 1855—Feb. 25, 1920

JAMES GAYLEY, one of the country's most distinguished iron and steel metallurgists, and for many years a commanding figure in the industry, died on Feb. 25 at his home, 555 Park avenue, New York, of heart disease with attendant complications. He had been ill for about a month. Of Mr. Gayley's active career, 23 years were spent with the United States Steel Corp. and its predecessors, Carnegie Brothers & Co., Ltd., and the Carnegie Steel Co. In 1901, when the United States Steel Corp. was formed he became vice president, in charge of raw materials and transportation, and retained this office until his resignation in 1908. At the time of his death, Mr. Gayley was president of the American Ore Reclamation Co. and the Sheffield Iron Corp., with offices at 71 Broadway, New York.

The subjoined sketch of Mr. Gayley's life and work was prepared by the late J. E. Johnson Jr., in connection with some honor he had in mind to propose for the former. Himself an iron and steel works engineer and metallurgist of high rank, and a co-worker of Mr. Gayley, Mr. Johnson's appreciation is peculiarly appropriate at this time.

JAMES GAYLEY, metallurgist, was born at Lock Haven, Pa., Oct. 11, 1855, son of Samuel A. and Agnes (Malcolm) Gayley. A few months later the family removed to West Nottingham, Md., where his boyhood was spent. His father was a native of the north of Ireland, and coming to this country in early manhood became a Presbyterian minister in Pennsylvania. His maternal grandmother was a sister of Sir Henry Bell, who first established steam navigation on the Clyde in Scotland. He was educated at the West Nottingham Academy in Maryland. From the West Nottingham Academy Mr. Gayley went to Lafayette college, taking a course in the department of mining engineering, and graduated in 1876. He began his professional career as chemist of the Crane Iron Co., Catasauqua, Pa. Three years later he went to the Missouri Furnace Co., St. Louis, in the capacity of superintendent. That position he resigned to assume the management of the blast furnaces of the E. & G. Brooke Iron Co., Birdsboro, Pa. In 1885 he was put in charge of the furnaces of the Edgar Thomson Steel Works at Braddock, Pa., which were owned by Carnegie Brothers & Co., Ltd., and which subsequently became the Carnegie Steel Co. There he was largely instrumental in bringing American blast furnace practice up to a plane never before attained. His record with the Edgar Thomson furnaces, everything considered, has not been surpassed for fuel economy, cutput in proportion to cubic capacity, of stock and of durability of linings. The furnace practice in the Pittsburgh district, where fuel was relatively cheap, was to use it wastefully and carry a heavy blast. Mr. Gayley attained better results with a moderate blast and relatively low fuel consumption per ton of iron. He was next promoted to be manager of the entire Edgar Thomson plant, and in 1897 became a man-



aging director of the Carnegie Steel Co. While at the Edgar Thomson works he was the first to install charging bins for the raw materials at the blast furnaces and also installed the first compound condensing engine for supplying air blast to a blast furnace. At the ore docks of the Carnegie Steel Co. at Conneaut, O., on Lake Erie, he installed the first mechanical ore unloader and designed a vessel construction adapted to the use of such unloaders.

During his brilliant career as an iron and steelmaker, Mr. Gayley made many important contributions to the progress of metallurgical industry. Among his valuable inventions may be mentioned the bronze cooling plate for blast furnace walls; the auxiliary stand for holding the ladle while the bessemer heat is being poured, supplementing the crane and enabling two vessels to do the work for which four were formerly required, and the "dry air blast." The last-named invention is probably the most important since Neilson's application of the hot blast in its relation to the reduction of iron ores, but its usefulness is not restricted to blast furnace practice. One of the chief

(Concluded on Page 734)

James Gayley, Blast Furnace Genius

His Achievements Recognized by Appreciative Iron and Steel Industry

E. H. GARY

Chairman United States Steel Corp.

JAMES GAYLEY was possessed of fine qualities of mind and heart. His education, general and technical, was superior. Consequently he was well equipped to reach and hold a high place in the estimation of all who knew him. In business he was eminently successful. He had no enemies, but hosts of friends. He was just and generous in the treatment of all his associates in business, particularly subordinates. As first vice president of the United States Steel Corp. for many years he was respected, trusted and loved. He was the recipient of many honors and fully deserved them all. As one who knew him intimately I cherish his memory and grieve because of his death.

J. G. WEST JR.

General Superintendent Blast Furnaces Jones & Laughlin Steel Co.

IN THE passing of James Gayley we see a large gap in the rapidly thinning ranks of that sturdy type of early pioneers, the vanguards of the creators of the system which enabled the American steel industry to accomplish results the magnitude of which was never before dreamed of. Differing from a great many others of this early period, he used and perfected scientific methods which were much in advance of the time and were clear marks of aid for those who followed.

It was his early results, through greater production, better efficiencies and improvements in design which laid sure foundations of what was to be known as the "American Method of Pig Iron Manufacture." During this period his works startled the world by its departures and results.

His was truly a career whose lights of accomplishments marked the channel of progress in American blast furnace practice.

H. A. BRASSERT

Freyn, Brassert & Co., Chicago

WITH James Gayley's death, the last chapter has been written in the life book of a truly remarkable man. However his fame as the father of modern American blast furnace practice will be engraved in monumental letters in the history of the iron and steel industry. We gratefully acknowledge our indebtedness to him for the inspiring example that he set for his followers.

WALTER S. REED

Close Business Associate

I HAVE been asked to furnish an appreciation of James Gayley with particular reference to his personality. The task would not be difficult if it were possible to describe in a few lines the close association with him of upward of 20 years as clerk, secretary, business associate and friend.

Mr. Gayley was one of those fortunate men who, during his lifetime, received credit for his accomplishments, and not only since his death but throughout his life many tributes have been paid him, but they mainly cover the magnificent contribution which his life gave to the art of metallurgy. I believe it is a fact that no man ever lived who injected into his work a personality more striking and that personality will remain in the memory of all who knew him while life lasts.

The story is told that when Mr. Gayley was a young man and entered college, it was the custom to nickname the various members of his class after some mineral and the appelation was given to him of "Stratified Granite." The designation was appropriate and it fitly described the personality upon which he was building the foundation for his future life work; and that personality lasted until the time of his fatal illness. In all that he did he gave to the observor the impression of strength, virility, tenacity and inflexibility. On the other hand, one could not come in close contact with him without finding that under the apparently granitelike exterior there was a heart full of human kindness, of helpfulness and of good humor. No man ever asked him for help in his work and was turned away. He loved his profession and was jealous of it, and his mind constantly turned to the future; the great joy of his life was the service he rendered in fitting young men for the field he loved so well. He loved a furnace as a hunter loves his dog. The sound of a blowing engine was as music to his ears, and he was never happier than when delving into the mysteries of Mother Earth.

Worst Is Over for Steel Industry

Unfavorable Features of Earning Reports Belong to Past—Present and Future Promise Great Activity to Meet Tremendous World-Wide Demand—Republic and Lackawanna Reports Show Strike Effects—General Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

NOTWITHSTANDING the fact that the steel strike last fall ostensibly was directed against the United States Steel Corp. primarily, the annual reports of the various important companies in the industry, most of which have appeared, reveal that the independent interests were the worst sufferers. The earning showings of the Republic Iron & Steel Co., and of the Lackawanna Steel Co., contrasted with those of the Steel corporation, confirm the fact, generally recognized, that the Mahoning valley in Ohio, and Buffalo, were among the most fertile hotbeds of radical agitation rather than Pittsburgh—the citadel of the corporation.

The annual reports of the Republic and Lackawanna companies indicate that fourth quarter operations, crippled greatly by the steel and coal strikes and transportation difficulties, were conducted at deficits of $694,823 for the former and of $960,487 for the latter, while the corporation had available for dividends at the close of that period the sum of $17,880,990.

The unfavorable features of the steel companies' reports, however, belong wholly to the past. A study of the statements of various executives to their stockholders, the vast amount of unfilled orders on the books of virtually every steel producer of consequence, and the unmistakably great shortage and pressing world-wide demand for iron and steel products combine to prevent any feeling of apprehension over the iron and steel outlook. This feeling is well exhibited in the case of the Republic Iron & Steel Co., whose 1919 earnings were inadequate to meet the dividend requirements of both the preferred and common stock. Yet the conservative management of this company did not hesitate to declare the dividends, the board of directors being of the opinion "that accumulated profits warranted a continuation of dividends at rates authorized particularly as an early return to normal operations and profits was prospective and has since been realized."

All steel company executives agree that the demand for their products exceeds the supply, the result of which has been rising prices and huge bookings. That unfilled orders of some leading companies would be even larger than they are if all offered orders were accepted, is made plain by the statement of Chairman John A. Topping, of Republic.

In considering the future of the iron and steel market two great factors are outstanding. One is that the curtailed production of 1919, which is being continued in a measure by the transportation difficulties in the present year, is yet to be made up. The other is that, with the railroad bill now a law and the roads back in the hands of private owners, a tremendous drain upon iron and steel output, superimposed upon the present demand, probably will appear from an important consuming source that for some time has been merely potential. The only clouds in the horizon are the transportation and credit situations. Both are serious but the coming months should see improvement in both. With the advent of open weather and, providing the new railroad legislation will re-establish the credit of the roads to enable them to finance their rehabilitation needs, there is hope for a new day for the railroads. What turn the banking credit situation is to take is not easy to foresee. Despite all the concentrated efforts of the federal reserve board the reserve system's ratio continues to decline, falling again last week to 42.5 per cent from 42.7 per cent of the week before. The theory has been advanced that the present expanded condition of banking credits is being aggravated by the railroad congestion which is preventing promised liquidation of commodities because their distribution is made impossible.

Republic Suffers Heavy Loss from Strike

The steel and coal strikes and transportation difficulties during the last quarter of the year combined to reduce net profits available for dividends of the Republic Iron & Steel Co. to $2,141,196 for 1919 as compared with $2,836,019 for the first nine months, indicating a loss during the final three months of $694,823. Because of the depression in the iron and steel industry during the first part of the year and the obstacles to operations at the close production was about 30 per cent less than in 1918, the annual report says.

Although the company earned less than the $3,382,687 preferred and common dividend requirements, regular payments have been made on the stock, the report quoting the directors as being of the opinion that "accumulated profits warranted a continuation of dividends at authorized rates, particularly as an early return to normal operations and profits was prospective and has since been realized."

Bearing out this view the statement shows a large increase in unfilled orders, for finished and semifinished products, the total as of Dec. 31 being 389,524 tons against 143,383 tons on the corresponding date in 1918 and 318,324 tons in 1917. Pig iron orders aggregated 96,855 tons against 63,132 tons in 1918. Referring to the market situation Chairman John A. Topping in his statement to stockholders says that "the current demand for iron and steel is in excess of supply at rising prices and that unless placed under check prices inevitably will rise further. As a result of these conditions the company has exercised a conservative policy of sales, otherwise our unfilled order balances would have been considerably in excess of those reported herein."

Of great interest is the section of the report summarizing wages and employment totals. The average number of men employed during the year by the company was 11,784 against 14,668 in 1918 and 14,510 in 1917. The aggregate payroll for the year was $21,466,605 as compared with $23,747,260 in 1918 and $17,574,480 in 1917. The report calls attention to the fact that the average wage per man last year was $1822 against $1619 in 1918; $1211 in 1917 and $979 in 1916. Thus it is stated the increase in wages is seen to have totaled 135 per cent whereas the cost of living advance is estimated not to have exceeded 82 per cent.

The gross volume of business during the year was $45,872,344 compared with $75,224,110 in 1918. Large reductions in both the depreciation and

federal tax items are revealed by the report. The balance sheet shows total expenditure for new construction in 1919 was $4,306,950, while the aggregate since the formation of the company $41,801,011. A total of $23,610,604 in net working capital is shown as compared with $28,729,968 in 1918. The comparative income account follows:

	1919	1918
Net earnings	$ 4,456,341	$18,177,046
Other income	575,496	729,768
Total profits	$ 5,031,837	$18,906,814
Depreciation	1,381,220	4,183,319
Mine exhaustion	460,905	512,620
Federal taxes, etc.	315,113	5,680,759
Net profits	$ 2,874,599	$ 8,530,116
Interest	733,403	738,182
Balance	$2,141,196	$ 7,791,934
Preferred dividends	1,750,000	1,750,000
Common dividends	1,632,687	1,631,460
Deficit	$ 1,241,491	*$4,410,474
Previous surplus	35,122,462	30,711,988
Total surplus	$33,880,971	$35,122,462

*Surplus.

Each department of the company shows curtailment in output during the year. A comparative summary of output of the company's principal products all in gross tons except finished and semifinished material and in coke net tons follow:

	1919	1918
Iron ore	1,272,707	1,512,071
Coke	959,602	1,207,896
Limestone	47,955	78,777
Pig iron	791,597	1,030,411
Bessemer ingots	433,687	615,970
Open-hearth ingots	318,730	503,732
Total ingots	752,417	1,119,702
Finished and semifinished products	702,040	1,024,040

Empire Profits Lower

Gross income of the Empire Steel & Iron Co., Catasauqua, Pa., decreased from $1,207,024 in 1918 to $851,789 in 1919, according to the company's annual report. Net profits available for dividends were $404,108 after reduction of $58,000 for federal taxes compared with $484,503 the previous year after deduction of $467,000 for taxes. Depreciation and interest charges amounted to $389,680 as compared with $212,525 in 1918. The comparative income account follows:

	1919	1918
Gross income	$851,789	$1,207,029
Depreciation and interest	389,680	212,525
Total net income	462,108	994,503
Federal tax	58,000	467,000
Contingencies	.....	43,000
Net for dividends	404,108	484,503
Preferred dividend	150,000	250,000
Net to surplus	254,108	234,503

President Leonard Peckitt in his statement to stockholders said that the average selling price of iron shipped was approximately $2.50 a ton less than the average for the preceding year, but despite reduced tonnage, production cost was lowered by $1.75 a ton. The total tonnage produced during the year at all furnaces was 154,962.

Completion of a modern skip filled furnace at Catasuaqua will increase production by about 150,000 tons of pig iron annually. This improvement is being carried on without special financing, President Peckitt said. Other contemplated improvements will require an increase in capital stock, he intimated.

Earnings of Lackawanna Show Big Slump

Following in the train of those steel companies the earnings of which were affected seriously by the difficulties of operation in 1919, the annual income statement of the Lackawanna Steel Co. shows a reduction in profits for the year of $9,408,242 as compared with 1918. Total net earnings for the year were $3,060,662 against $12,468,904 the previous year. The net available for dividends was equal to 1.02 per cent on the common stock outstanding against 23.79 per cent in 1918.

The company charged off $1,430,695 for depreciation and accruing renewals in 1919 as compared with $2,767,842 in 1918, a decrease of $1,337,146. Net profits for the year were $356,862 against $8,348,354 a falling off of $7,991,491. The company reports unfilled orders as of Dec. 31 were 248,405 as compared with 314,948 one year before. With the anticipated return of railroads into the market on a large scale, the company's business should improve largely during the current year. The comparative income account follows:

	1919	1918
Net after taxes and expenses	$3,060,662.68	$12,468,904.81
Lackawanna bond interest	896,169.58	923,558.75
Subsidiary bond interest	164,366.67	173,600.00
	1,060,536.25	1,097,158.75
Balance	2,000,126.43	11,371,746.06
Extension of minerals	212,567.82	255,548.71
Depreciation and renewals	1,430,695.95	2,767,842.83
	1,643,263.77	3,023,391.54
Profit	356,862.66	8,348,354.52

Wheeling President Urges Rail Rehabilitation

The transportation problem is becoming more and more serious and unless something is done speedily to rehabilitate the railroads it is going to be impossible for mining and manufacturing industries to operate at maximum capacity, in the view of President Isaac M. Scott, of the Wheeling Steel & Iron Co., as expressed in the company's annual report. Iron and steel plants are particular sufferers from the situation, he declared, and many were threatened with a curtailment of their earning power unless the roads were put in shape to render adequate services. Discussing the outlook, President Scott said:

"Although the business outlook is somewhat confusing it is on the whole encouraging. There is an active demand for all steel products and with no serious financial unsettlement or general labor disturbance, this demand should continue indefinitely."

Operations of the company were greatly curtailed and earnings sharply reduced during 1919, the report shows. Net earnings were $1,925,331 against $6,305,075 in 1918. During the year the company expended $818,799 for repairs and maintenance. The surplus for 1919 was $441,920 after taxes of $174,177 against a surplus of $4,752,055 in 1918 before taxes. Owing to the uncertainties of the tax law no reductions on this account were shown in the 1918 report, the item, amounting to $3,694,984, was charged off from total surplus in the 1919 statement. The comparative income account follows:

	1919	1918
Net earnings	$1,925,331	$6,305,075
Dividends and interest	219,869	291,661
Total income	2,145,201	6,596,737
Less, depree. and exhaust.	*721,136	770,467
Net profit	1,424,062	5,826,269
Bond interest	145,860	145,500
Surplus	1,278,201	5,680,769
Dividends	836,281	928,714
Net surplus	441,920	4,752,055

*174,177 for taxes.

The net working capital of the company as of Dec. 31, 1919, was $7,698,105 against $11,115,660 one year before. Inventories were reduced more than $700,000. Production of finished output during the year was 122,071 gross tons against 174,267 in 1918, 195,755 in 1917 and 184,500 in 1916. Pig iron production totaled 134,378 tons against 203,456 the previous year; 209,206 in 1917 and 210,183 in 1916.

Dissolution of the Lake Erie Foundry Co., Girard, Pa., was authorized by the court recently as a result of a petition filed by attorneys of the company. The stock and equipment of the concern was transferred to John A. Jurn, of Erie, for $25,000 and William C. Shafer was named to take charge of disposing of the property.

New Prices

On Refractories in Affect—Ask $45 for Fire Clay Brick

Pittsburgh, March 2.—New prices for refractories announced several weeks ago became effective March 1 with most companies, and apply both to new and unfilled orders, save those of the latter carrying a specified price. It is understood that comparatively little business, calling for deliveries over a period of more than a month, is taken at a specified price, the more general basis of contracts being price at time of shipment. Having given notice of the advance, it now is possible for manufacturers to invoice shipments at the new prices.

One large Pennsylvania maker of fire clay brick still is quoting first quality brick at $38 and is expected to hold at that base until April 1. Most of the other Pennsylvania makers, however, are holding for a minimum of $40, with some asking as high as $45.

Ohio and Kentucky first quality fire clay brick also take a range of from $38 to $45, while the more general asking price of Missouri makers for the best quality of brick is $50. The latter appear to have two first quality grades and this occasions some confusion among not only consumers, but also with producers in other parts of the country. Quotations of silica brick also have been revised to conform to the advances recently announced, but as yet little basis in sales exists for a price of more than $45 for Pennsylvania brick, or $50 for those made in the Chicago district.

Manufacturers in all parts of the country still are hampered in the matter of shipments by the lack of cars, and while makers who have some shed space left to fill are keeping up operations, a number have been forced to curtail. Present plant operations for the country at large average between 50 and 60 per cent.

Refractories

(Per 1000 f.o.b. works)

FIRE CLAY BRICK (First Quality)	
Pennsylvania	$38.00 to 45.00
Ohio	38.00 to 45.00
Kentucky	38.00 to 45.00
Illinois-Missouri	40.00 to 50.00
FIRE CLAY BRICK (Second Quality)	
Pennsylvania	$30.00 to 40.00
Ohio	22.00 to 30.00
Illinois-Missouri	35.00 to 40.00
SILICA BRICK	
Pennsylvania	$45.00 to 50.00
Chicago	50.00 to 55.00
Birmingham	46.50 to 51.50
MAGNESITE BRICK (Per Net Ton)	
9 x 4½ x 2½	$80.00 to 85.00
CHROME BRICK (Per Net Ton)	
9 x 4½ x 2½	$75.00 to 85.00
BAUXITE BRICK (Per Net Ton)	
55 per cent.	$40.00 to 45.00
76 per cent.	100.00 base

Becomes Identified With Hadfield Interests

Under negotiations recently completed the American Clay Machinery Co., Bucyrus, O., is to become identified with the Hadfield steel interests of England in the manufacture and distribution in this country of steel products under the processes developed by Sir Robert Hadfield of Sheffield which include manganese steel, etc. A new company known as the Hadfield-Penfield Steel Co., has been formed and the American Clay Machinery Co. will be merged into this corporation. Details of the plan were worked out by President R. C. Penfield and C. M. Wesson of the American company on a recent trip to England. A meeting of the stockholders of the American company has been called for April 1 when action will be taken on the amalgamation. Any new construction or development work that may be called for under the merger is in the indefinite or preliminary stage. The regular line of output of the American Clay Machinery Co. includes clay-working and cement-making machinery, bakery equipment, oil engines and ship deck equipment, etc. It is announced that Sir Robert Hadfield will be financially interested in the Hadfield-Penfield Steel Co.

Opens Cleveland Office

The McClintic-Marshall Co., steel fabricators, with headquarters in Pittsburgh, has opened a branch office in Cleveland. E. M. Sprague resigned as contract manager of the American Bridge Co., at Cleveland, to accept the position of contracting engineer in charge of the Cleveland office of the McClintic-Marshall Co., and E. A. Benson, who was his assistant in the office of the American Bridge Co., has joined him as assistant in his new office. Temporary quarters have been opened in room 209, Hotel Statler, and permanent quarters will be procured in the new Hanna building.

Frank D. Rideout, formerly contract manager in the Buffalo district for the American Bridge Co., Pittsburgh, has been appointed contract manager for the company in the Cleveland district succeeding Mr. Sprague. Mr. Rideout has been with the American Bridge Co. for the past 15 years, having been first connected with the Pittsburgh office in the erecting department and later in the contract department. He was born in Toledo, O., about 40 years ago and is a graduate of Purdue university. Mr. Rideout's successor at Buffalo has not been announced.

Large Car Orders

Received by Canadian Manufacturers —Sell Castings in United States

Toronto, Ont., Feb. 28.—W. W. Butler, president of the Canadian Car & Foundry Co., of Montreal, has announced that as the result of negotiations with the heads of the leading railroads the company has secured orders for rolling stock amounting approximately to $12,000,000. Of this amount orders have been received from the Canadian Pacific Railway Co. for freight cars to cost $5,000,000 and from the Canadian national railways system for both freight and passenger cars to cost $7,000,000. These orders in addition to those previously on hand bring the aggregate business now on the books of the company up to nearly $20,000,000.

Mr. Butler also states that the demand for castings and other car building accessories from the United States has assumed considerable proportions and is keeping the company's plant at Brantford, Ont., busy. The company is negotiating for European business and its recent association with the American Car & Foundry Co. has been found of much advantage.

The Canadian national railways have placed orders with the Nova Scotia Steel & Coal Co. for 500 box cars and 500 general purpose freight cars involving an expenditure of about $3,000,000. The cars will be manufactured by the Eastern Car Co., a subsidiary of the Nova Scotia company, and will keep the plant in operation at capacity for some months.

In addition to this business, the Grand Trunk railway, according to Howard G. Kelly, president, will be in the market at an early date for extensive additions to rolling stock.

The National Electric Products, Ltd., Montreal, Que., has been formed with $5,000,000 capital stock. The company will establish a number of plants in Canada for the production of oxygen.

The Tube Co. of Canada, Ltd., has obtained a plant at 233 Dufferin street, Toronto, and will manufacture welded steel tubing.

The P. H. & F. M. Roots Co., Connersville, Ind., contemplates selling its present foundry with all equipment.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

F. J. MAWBY, who was connected with the sales force of Manning, Maxwell & Moore, Inc., and located at its New York office for a number of years, severed his connection with this interest Feb. 1. He now is a member of the sales organization of the Cincinnati Shaper Co., and Cincinnati Gear Cutting Machine Co., Cincinnati. During the war, Mr. Mawby did a great deal of engineering work in connection with the equipping of shops for making ammunition, guns and gun carriages for both foreign and the United States governments, and was responsible for the development of a number of special machines for rapid production on time and high explosive fuses.

Robert E. Wilbur has been elected second vice president of the Bethlehem Foundry & Machine Co., Bethlehem, Pa.

W. J. Chase has been re-elected president of the Napoleon Motors Co., Traverse City, Mich.

Charles E. Smart, manager of the Wells Bros. division of the Greenfield Tap & Die Corp., Greenfield, Mass., has resigned.

Norman Cooley of the Hart & Cooley Co., New Britain, Conn., has been elected president to succeed Howard G. Hart who becomes chairman of the board of directors.

J. A. McLennan, general superintendent for the Link-Belt Co., at Philadelphia, has been made general manager of the McDonough Mfg. Co., Eau Claire, Wis.

Hiram N. Rasely, for the past five years correspondence and office supervisor of the Norton Co., Worcester, Mass., has resigned to establish himself in business as correspondence counselor.

Carlton B. Lees for the past five years buyer for Spencer Bros., Inc., Suffield, Conn., has resigned to represent the Supplee-Biddle Hardware Co., Philadelphia, in Connecticut and Rhode Island, beginning March 8.

William M. Adams, for the past year auditor for the Emergency Fleet corporation, attached to the Texas Steamship Co., Bath, Me., became welfare manager for Watson, Frye & Co., Inc., builder of special machinery in that city. March 1, succeeding Chester M. Schubert, who has been transferred to the New York office of the Texas Steamship Co.

Philip Thayer, acting manager of the export department of the Greenfield Tap & Die Corp., Greenfield, Mass., has resigned to become manager of the foreign sales department of the Reed & Prince Mfg. Co., Worcester, Mass.

Charles E. Hildreth, president and general manager of the Whitcomb-Blaisdell Machine Tool Co., Worcester, Mass., has been elected vice president of the New England Foundrymen's association.

F. J. Hough has been appointed superintendent of the Collins Co., Collinsville, Conn., to fill the vacancy caused by the recent death of C. H. Smith, and Clair M. Elston has been promoted to assistant to succeed Mr. Hough.

Frederick C. Butterfield, head of the cost department of the grinding machine division of the Norton Co., Worcester, Mass., has become assistant to the president and general manager of the Taft-Pierce Mfg. Co., Woonsocket, R. I., builder of special machinery.

Lawrence V. McGarvey, who has resigned as assistant sales manager of the Peck, Stow & Wilcox Co., Southington, Conn., will assume his new duties in the sales department of the Du Pont Powder Co., Wilmington, Del., March 1.

William McCarroll, for the past 11 years assistant chief clerk in the Hartford, Conn., office of the New York, New Haven & Hartford railroad, has resigned to become assistant purchasing agent of the Hartford Machine Screw Co., a branch of the Standard Screw Co.

Byron J. Erb, for many years Buffalo manager of the Burroughs Adding Machine Co., is president of the National Plier Co., 67 Forest avenue, Buffalo, recently organized to manufacture pliers. The company has not yet decided if a plant will be erected.

Martin J. Dowling, formerly general superintendent of the South Side works of the Jones & Laughlin Steel Co., Pittsburgh, recently retired after 34 years service with that company. Mr. Dowling's first connection with the steel industry dates back 45 years, when he went to work at the Edgar Thomson plant of the Carnegie Steel Co. in 1875 and was there until 1886 when he went with the Jones & Laughlin Steel Co., first in charge of the bessemer department and later as general superintendent of the South Side works.

Thomas G. Bennett, formerly president of the Winchester Co., the holding company of the Winchester Repeating Arms Co., New Haven, Conn., has been elected chairman of the board of directors.

Edmund P. Briggs, for the past two years resident inspector for the Emergency Fleet corporation, attached to the Texas Steamship Co., Bath, Me., became general manager of Watson, Frye & Co., Inc., builder of special machinery in that city, March 1.

A. W. Link, who founded the Bay View Foundry Co., Sandusky, O., 16 years ago, is to retire shortly as president and will be succeeded by E. Lea Marsh, at present secretary and assistant treasurer. The offices formerly held by Mr. Marsh will be filled by F. L. Harten.

Alfred B. Grout, who has been office manager for the Woonsocket Machine & Press Co., Woonsocket, R. I., since June, 1914, has resigned to become assistant treasurer and assistant manager of the Leader Weaving Co., Pawtucket, R. I. He will be succeeded by Herman J. Nova, who has been with the company the past five years.

W. G. Sharp of the iron ore mining department, M. A. Hanna & Co., has been appointed general manager of the Marting Iron & Steel Co., Ironton, O., succeeding Otto Marting. This appointment follows the recent reorganization of the company and the purchase of an interest in the company by Cleveland interests.

Herman Muus, who has been with the Radcliffe Co., New Britain, Conn., has joined the sales department of the Peck, Stow & Wilcox Co., Southington, Conn. Stanley Rand, Washington, who has been on the road several years for the Peck, Stow & Wilcox Co., has succeeded L. V. McGarvey as assistant sales manager.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

CYRUS F. MACKEY, who recently was made general manager of the Franklin Steel Works, Franklin, Pa., succeeding Edward E. Hughes, resigned, has been with the company since 1903. He joined the company, then known as the Franklin Rolling Mill & Foundry Co., that year as general superintendent. The latter company was reorganized and became part of the Chicago Railway Equipment Co. Mr. Mackey then became assistant general manager of the company which was acquired by the Franklin Steel Co. in 1909, and held this position until recently, when he was promoted to the position of general manager. In 1912 the name was changed to the Franklin Steel Works Co. Mr. Mackey was graduated from Yale university with the class of 1896, with a degree of bachelor of arts. In the fall of that year he entered the steel business, becoming identified with the Franklin Steel Castings Co., which later became a part of the American Steel Foundries. Leaving this company before this change, Mr. Mackey went to California, where he remained for several years, returning in 1903 to Franklin.

R. M. Clifford is now representing the Fairbanks Co., Chicago, on the iron ranges at Duluth and Superior.

Howard Kenworthy has been placed in charge of the Cleveland office at 356 Leader-News building, of the Newton Steel Co., Newton Falls, O.

Harry F. Busch has resigned his position with the Chapman Valve Mfg. Co., Indian Orchard, Mass., to accept the superintendency of a foundry in Gardner, Mass.

J. F. Hunter has been appointed acting general sales agent for the Virginia Iron, Coal & Coke Co., Roanoke, Va., succeeding O. B. Newton, resigned.

H. H. Hunner, who has been superintendent for the Onahman Iron Co., Cuyuna range, now is superintendent of mining for the Cornwall Ore Bank Co., Cornwall, Pa.

Harry Gieseking, who for the past 10 years, had charge of the Phoenix Works. Detroit now is in the sales department of the Acme Fancy Wire Works, Canfield avenue and Moran street, Detroit.

C. W. Elton, formerly with the J. H. Matthews Co., Pittsburgh, has severed his connection with that company to become general manager of the Pittsburgh Steel Stamp Co., Inc., Pittsburgh.

Theodore A. Martin, foundry superintendent, has severed his connection with the George H. Smith Steel Castings Co., Milwaukee, and at present is installing a new steel foundry for the Erie Forge Co., Erie, Pa.

CYRUS F. MACKEY

F. C. Sullivan, vice president of the Braddock Mfg. Co., the plant of which recently was sold to the Wilson-Snyder Mfg. Co., Pittsburgh, hereafter will devote his entire attention to the Columbiana Foundry Co. of which he became president early in 1917.

William C. Reitz, secretary and treasurer of the Pittsburgh Steel Products Co., Pittsburgh, has been appointed by Governor Sproul a member of the Lake Erie and Ohio canal board of Pennsylvania to succeed W. U. Follansbee, president of the Follansbee Bros. Co., Pittsburgh, who recently resigned.

Rudolph Wegelin, recently connected with Jenbert & Geslin Machine & Foundry Co., Birmingham, has been placed in charge of the new gray iron foundry, being erected for the Dixie Brass & Foundry Co., that city.

Thomas H. Kane, vice president and works manager of the Truscon Steel Co., Youngstown, O., has been elected a member of the board of directors. He takes the seat made vacant by the retirement of Joseph Boyer, of Detroit, who declined re-election. Mr. Kane is in direct charge of the Youngstown plant.

Carroll Burton, formerly chief engineer and works manager of the Lorain Steel Co., Johnstown, Pa., has been named president of that company to succeed I. Lamont Hughes, who recently resigned to become Youngstown district superintendent of the Carnegie Steel Co. Mr. Burton has been connected with the Lorain Steel Co. for several years.

John J. Isherwood, formerly first lieutenant of the eighty-third field artillery, eighth division, American expeditionary forces, has become a salesman with the Eureka Fire Brick Works, First National bank building, Pittsburgh, manufacturer of clay fire brick, etc. Prior to entering military service in August, 1917, he was studying chemistry at the University of Pittsburgh.

Col. Gabriel R. Solomon, formerly of the Solomon-Norcross Co., Atlanta, Ga., consulting engineer, has been discharged from the service and resumed the practice of his profession as vice president of the Fuller Industrial Engineering Corp., New York City. While in the service he was in charge of the engineering branch, construction division, of the United States army.

J. Edwin McKinley has been named by the National Trading Co., 1307 Swetland building, Cleveland, as manager of its refractories department, effective March 1. Mr. McKinley has been connected for a number of years, with the Crescent Refractories Co., Curwensville, Clearfield county, Pa., in both the manufacturing and sales end of the business. His headquarters will be at Cleveland.

Month's Demand Offers Contrast

Machine Tools and Cranes Find Ready Market During Early Part of February—Inquiries and Orders Fall Off in Last Two Weeks—Automotive Industries Continue to Take Heavy Quota — Railroads Beginning to Buy

KEEN demand for machine tools and cranes marked the first part of February which contrasted with a decided lull during the latter half of the month. By some interests, the falling off is considered the natural sequence of recent heavy buying but others have laid it to unsettled financial conditions, and to poor deliveries from manufacturers coupled with constantly increasing prices, etc. Numerous price advances ranging from 5 to 25 per cent were noted in February. One manufacturer of milling machines increased his line twice in four weeks, adding 15 per cent each time. One Cleveland seller is offering a line of machine tools for February, 1921, delivery. Such facts tend to discourage buyers who consequently are confining their purchases in large part to absolute needs. By the same token, the sale of used machinery has gained impetus; many users are filling their requirements in whole or in part from second hand offerings. The Wright Aeronautical Corp., New Brunswick, N. J., bought heavily of this class of equipment.

First Orders Come Out from Railroads

AGAINST their return to private ownership, the railroads are looking to their equipment needs. A few already are making purchases in order to insure proper deliveries. The Boston & Maine and the Baltimore & Ohio, both closed for equipment, the latter taking about $50,000 worth of repair shop machinery. The Nickel Plate issued a list of 28 miscellaneous machines in Cleveland. The New York, New Haven & Hartford railroad bought fabricating equipment in the east, while the Chicago, Indiana & Western railroad was understood to be preparing a comprehensive list for issuance in Chicago and elsewhere. Railways in and around Pittsburgh, are issuing inquiries from time to time. The Pennsylvania railroad bought four cranes while the New York Central inquired for several electric cranes.

Automotive Industries Far from Saturation Point

MOST of the requests for machine tool equipment during February came from the automotive industries. These have led other lines for several months and the capacity of these plants to absorb equipment seems unending. Mercer Motors, Inc., Trenton, N. J., closed on special production equipment and about $125,000 worth of standard machines. The Pierce-Arrow Motor Car Co., Buffalo, carried on extensive negotiations with reference to its $1,000,000 or more list; among other purchases were 20 multiple spindle drills from a Cleveland dealer. The White Motor Co., Cleveland, issued a $75,000 list and bought freely. The Willys Corp., Elizabeth, N. J., purchased about $125,000 worth of machinery and the Fairmount Motor Car Co., Fairmount, W. Va., put out a fair sized list. The Paragon Motor Car Co., Connellsville, Pa., opened an office in Cleveland to look after its equipment purchases. The Packard Motor Car Co., Detroit, is understood to have closed on 30 screw machines.

Tractor companies played an important part in the past month's trading. The Franklin Tractor Co., Greenville, O., issued a sizable list. The Superior Tractor Co., Erie building, Cleveland, asked for drills. The Cleveland Tractor Co., that city, entered the market from time to time, while the J. T. Tractor Co., Bangor building, also of Cleveland, bought several multiple spindle drills and announced it would issue a large list June 1. Henry Ford & Son bought over 20 automatic screw machines for the Hamilton, O., tractor plant.

Parts manufacturers figured largely in February machine tool activity. Perhaps the largest list to reach Cleveland in recent weeks came from the Detroit Gear & Machine Co., Detroit, asking for 60 tools for No. 1 plant, 39 for plant No. 2 and 15 for its tool room. The Eaton Axle Co., Cleveland, now a part of the Standard Parts Co., made extensive purchases and latterly was lining up further needs. The Torbensen Axle Co., that city, also made purchases from time to time. The General Electric Co. bought 11 machines for Buffalo and fabricating equipment for Pittsfield, Mass. The Gearless Motor Corp., Pittsburgh, issued a list of 37 items.

Miscellaneous Industries Fairly Large Buyers

DIVERSIFIED industries entered the equipment market in February. The Crane Co., Chicago, bought a fairly large number of machines for Buffalo and Bridgeport, Conn., plants. The New Departure Mfg. Co., Bristol, Conn., was reported to be ready to commence to buy on its $600,000 list. The New Britain Machine Co., New Britain, Conn., purchased $200,000 worth, while the Bethlehem Motors Corp., Allentown, Pa., closed on 15 machines and said it would buy more later. The Chisholm Shovel Works, Cleveland, bought several drill presses and is in need of additional equipment. The Eastern Engineering Co., Detroit, issued a comprehensive list, while the Columbia Graphophone Co. bought heavily on its list for Baltimore and Toronto, Ont., shops. The Trumbull Steel Co., Warren, O., issued a list of seven heavy tools, while the Continental Can Co., Chicago, asked for 15.

Few Items Noted in Export Trade

FALLING exchange rates militated against the sale of much American-built equipment abroad in February. A Japanese buyer took six shapers from a New York dealer. Approximately $100,000 worth of sugar machinery and hoisting equipment went to Cuba. The American Steel Co., of Cuba, subsidiary of the Pressed Steel Car Co., Pittsburgh, issued a list of seven cranes for Havana, Cuba. The Phelps-Dodge Copper Co. bought three overhead cranes for Mexico, while several cranes of the same type were bought by the Technique Bureau Braat Ltd., 90 West street, New York, for shipment to Holland. Fabricating equipment for Mexico was bought by the American Metals Co., 61 Broadway, New York, and this company also inquired for three electric cranes.

Cranes Find Many Takers Who Are Expanding

STEEL plant projects fast coming to a head mean much to crane sellers. The American Rolling Mill Co., Middletown, O., bought 10 electric cranes for its new plant at Zanesville, O. The Jones & Laughlin Steel Co., Pittsburgh, closed on four, while the Otis Steel Co., Cleveland, bought $100,000 worth of heavy electrical equipment for its new sheet plant and inquired for six cranes. The Carnegie Steel Co. bought four for its Upper Union mills, Pittsburgh. The Mansfield Sheet & Tin Plate Co., Mansfield, O., issued an inquiry for 10 good sized cranes and several others took one or two each. Other industries were fairly well represented. The American Car & Foundry Co., New York, awarded over 10 2-acre cranes while the Pittsburgh Plate Glass Co., Pittsburgh, inquired for five cranes for Ford City, Pa., and six for Kokomo, Ind.

Tool Trade Slackness Continues

Withholding of New Business Which Started in February's Third Week Still Prevails—Inquiries Are Fewer and Orders More Scarce—Mansfield Sheet & Tin Plate and American Car & Foundry Award Cranes

SLACKNESS which marked the machine tool and equipment market during the third week in February, continued into the past week. Contributing factors to the lowered inquiry rate and the reduced number of orders include, according to prominent machinery sellers, such things as advancing prices coupled with deferred deliveries, the curtailment of loans by banks to manufacturers whose expansion plans and building projects depend upon borrowed capital, etc. Several inquiries are being withdrawn, where requirements can not be filled with used machinery.

A fair demand continues to exist for heavy equipment, several dealers in Cleveland reporting a few sales and a few inquiries for presses, hammers, etc. The Faultless Caster Co., Evansville, Ind., still is endeavoring to locate nine presses, eight or nine lathes, four shapers, milling machines, automatic screw machines, etc. The Electric Steel & Forge Co., Cleveland, will install six hammers and three rolling mills. The Spencer Metal Products Co., Spencer, O., bought trimming presses and soon will order furnaces and other forge shop equipment.

Pittsburgh reports a number of crane awards, while machine tool dealers note a paucity of machine tool demand. The Mansfield Sheet & Tin Plate Co., Mansfield, O., awarded 10. The Western Steel Car Co., subsidiary of the Pressed Steel Car Co., Pittsburgh, bought three for shipment to Cuba. Several companies bought one each. The General Electric Co., inquired for three for Erie, Pa., while the American Sheet & Tin Plate Co., issued an inquiry for four for New Castle, Pa. Those asking for one each include the Pittsburgh Crucible Steel Co., for Midland, Pa., the Koppers Co., with the Peoples Gas Co., Chicago. Further east the awards include 13 cranes by the American Car & Foundry Co., and one each by Gilbert & Barker Mfg. Co., Springfield, Mass., Stone & Webster, Lowell, Mass., New England Structural Co., Everett, Mass.

February sales are expected to compare favorably with January in Chicago. In that territory users of heavy equipment such as boring mills, turret lathes, etc., are particularly active. One inquiry now before dealers calls for 25 18-inch x 24-foot lathes for service stations of a tractor manufacturer. Some machines sold for export on which delivery was held up owing to the foreign exchange situation, now are available for domestic sale.

Canada reports some activity among the railroads, several lines preparing to purchase large amounts of rolling stock, and this is encouraging to machinery dealers, since it is thought that much machine tool equipment likewise will be purchased. Now that the railroads in the United States have been returned to private ownership, considerable buying is expected within the next few weeks, since all roads are in need of repair shop tools.

Cleveland Dealers Receive Few Tool Inquiries

DEMANDS upon sellers of machine tools and equipment in the Cleveland territory are at a low ebb. Pressure is being brought to bear upon machinery manufacturers to obtain better deliveries but with negligible success. As deliveries become more deferred, some users are dropping out of the market, recalling their inquiries while a few are satisfying their immediate requirements with used equipment. Curtailment of loans by banks is a deterrent to plans of extension of a number of companies. Several companies who sent out tentative inquiries for machine tools, etc., are not being heard from because of the present financial condition. A little difficulty is being noted in the matter of collections.

Among the few interesting inquiries before the trade is one which was issued some time ago and on which a number of machines still are wanted. This came from the Faultless Caster Co., Evansville, Ind., and calls for the following: Presses, No. 3, No. 4, No. 5 and No. 63 Consolidated; No. 3½ and No. 4 Toledo; No. 20, No. 21 and No. 52 Bliss; milling machines, No. 1½ and No. 2 Brown & Sharpe; shapers, 16, 20, 24 and 28-inch; eight or nine lathes, 14-inch x 6-foot, 5-inch x 6-foot, Hendey, Bradford, Lodge & Shipley or equivalent; several ⅜ and ½-nich Cleveland automatic screw machines, model B; plating dynamos, tumbling barrels, steel lockers, etc. The Clark Roller Co., Kalamazoo, Mich., is receiving quotations on a number of Gisholt 24-inch turret lathes and 4-spindle drilling machines. The Electric Steel & Forge Co., Cleveland, is equipping with two 2500, two 1500-pound and 12,000, 800 and 600-pound steam hammers and 8, 12 and 16-inch rolling mills. The Reliance Motor Truck Co., Appleton, Wis., has issued a comprehensive list of machine tool requirements, which includes everything from drill presses to turret lathes and grinding machines. The Greenville Iron Works, Greenville, S. C., estimates its present machine tool requirements at $30,000 for a new machine shop and patternmaking plant. The Wheeling Machine Products Co., which formerly was the Wheeling Machine & Welding Co., Inc., Wheeling, W. Va., is in the market for several automatic screw machines. Three punch presses like No. 18 Bliss

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are wanted by the Anglo-Canadian Metals, Ltd., 525 Spadina avenue, Toronto, Ont. The Automatic Soda Fountain Corp., Norfolk, Va., wants machinery for building soda fountain equipment. The John F. Byers Co., Ravenna, O., has issued a fair sized list. The Southern Veneer Mfg. Co., Louisville, Ky., is understood to be in the market for woodworking machinery. The Cleveland Abrasive Wheel Co., Hippodrome building, Cleveland, recently purchased some equipment but still is in the market for about $20,000 worth, including lathes, ovens, etc.

The United Roll & Foundry Co., Ravenna, O., recently sent a representative to Cleveland, who bought one 24-inch Milwaukee shaper, one 42 x 42-inch x 16-foot Cleveland open-side planer, one 5 x 6-inch Peerless power saw, one 54-inch Bullard boring mill and one 16-inch x 6 foot Hendey lathe. The Parish & Bingham Corp., Cleveland, recently purchased a 24-inch back geared Gould & Eberhard shaper among other equipment. The Dayton Tool & Die Co., Dayton, bought a No. 1 plain Ohio milling machine. The Spencer Metal Products Co., Spencer, O., which is equipping its own forge shop and recently closed on hammers, bought two trimming presses recently, 1000 and 2500-pound, and will buy its furnaces shortly as well as smaller equipment.

Smaller inquirers include such companies as the Torbensen Axle Co., and Eaton Axle Co., part of the Standard Parts Co., Jordan Motor Car Co., and the Templar Motors Corp., all at Cleveland. The Lux Electric Fixture & Art Mfg. Co., Janesville, Wis., wants punch presses. The Perfection Piston Ring Co., Ravenna, O., wants a 14-piston slitting or slotting machine. Charles L. Hills, 305 National Bank building, Wheeling, W. Va., is in the market for a 3 or 4-foot plain or universal radial drill and some other equipment for a 50 x 200-foot steel building with two 25-foot bays being erected for foundry purposes. The Interstate Machinery Co., Troy, N. Y., is endeavoring to locate plain milling machines for one of its customers and received a late quotation on a Kempsmith No. 3 complete with vises, dividing head and regular equipment.

Postponements are more or less frequent. The Mason Tire & Rubber Co., Ravenna, O., will purphase its requirements in the spring. The Mackay Truck & Tractor Co., that city, will close on about $40,000 in two weeks. The Ravenna Rubber Co., Ravenna, which has been sending out its machine work, expects to equip its own shop soon.

Lists are expected soon from the Karl Kiefer Machine Co., Cincinnati, O., manufacturer of canning machinery, which is having plans prepared for a new building; Samuel Peterson, Inc., Warren, Pa., incorporated at $200,000 recently, to manufacture tools; Raymond Thompson Co., Louisville, Ky., recently organized to manufacture auto parts; Rowe Mfg. Co., Lancaster, Pa., which will double its truck-manufacturing capacity; and the Spencer-Smith Machine Co., Howell, Mich., which is erecting an addition.

Several Crane Awards Reported

SEVERAL crane awards have been announced in the Pittsburgh district lately. The largest of these was that of the Mansfield Sheet & Tin Plate Co., Mansfield, O., which awarded the 10 cranes, recently inquired for, to the Alliance Machine Co., Alliance, O. The Western Steel Car Co., a subsidiary of the Pressed Steel Car Co., Pittsburgh, has placed three of the seven cranes it recently asked for to go to another subsidiary of the Pressed Steel Car Co., the American Steel Co. of Cuba. These cranes, one 5-ton 59-foot span, one 5-ton 53-foot span and one 5-ton 2-trolley 73-foot span, were placed with the Whiting Foundry Equipment Co., Harvey, Ill. The Griscom, Russell Co., Massillon, O., has closed with the Pawling & Harneschfeger Co., Milwaukee, for a 10-ton crane, while the Milwaukee Electric Crane & Mfg. Co., Milwaukee, was the successful bidder for a 5-ton crane for the Ideal Electric Mfg. Co., Mansfield, O. The Chesapeake Iron Works, Baltimore, has secured a 20-ton, 35-foot span crane for the Franklin Valveless Engine Co., Franklin, Pa., and a 5-ton, 70-foot span crane for the By-Products Steel Corp., Steubenville, Pa.

New inquiries for cranes are rather fewer than they have been, but the General Electric Co. is seeking bids on a 20-ton and two 5-ton cranes for its Erie, Pa., works, while the American Sheet & Tin Plate Co. wants three or four for its New Castle, Pa., plants and the Pittsburgh Crucible Steel Co. is looking for a 10-ton powerhouse crane for its plant at Midland, Pa. Inquiry also has gone out for a crane for the new by-products plant soon to be erected in Chicago by the Koppers Co., Pittsburgh, in conjunction with the Peoples Gas Co., Chicago.

Recent advances appear to be causing some paucity in the demands for machine tools.

Users Lack Confidence in Future

CONDITIONS in the machine tool market in Chicago are satisfactory to all dealers and the gross business for February promises to compare excellently with other months and in some cases has established a record. However, some dealers find a tendency on the part of buyers to refrain from making contracts where delivery is deferred several months, apparently being uncertain as to the future. It has happened in a number of instances that inquiries have been withdrawn after it was found impossible to get reasonably prompt deliveries and buyers will not place the business at this time. In some other cases, inquiries have been withdrawn without any apparent reason, which possibly indicates that prospective buyers have an idea that prices may be lower during the present year.

Most demand at present is for light equipment in small lots, although users of heavy machinery are taking somewhat more than was the case late last year. One inquiry now current calls for 25 18-inch x 10-foot lathes for service stations of a tractor manufacturer. These are desired for prompt delivery and probably will be distributed among a number of sellers. Deliveries are becoming more deferred as a general rule, but some machinery sold for export on which delivery is held up because of the foreign exchange situation now is available for prompt delivery to domestic users. This is easing the situation somewhat, but there is not enough of this to be a large factor.

The Pullman Co. is building two additions to its plant at Pullman, a suburb of Chicago. The Alenite Die Casting & Mfg. Co. will build a plant in Chicago and the La Salle Steel Co. will build a plant at Hammond, Ind. The Milholland Machine Co., Indianapolis, is building a machine shop. The Sinclair Refining Co. will build a refinery at East Chicago, Ind.

Railway Business Uppermost in Canada

IN ADDITION to the growing demand for machinery and machine tools in the Canadian market, word has been received of several of the railways of the Dominion who have either placed orders for equipment, rolling stock, locomotives, etc., or are in the market for such equipment. Chief among these is the Canadian National railways, which has just closed a contract for equipment totaling $7,000,000 for freight and passenger cars. Other orders from this source are expected to be placed at an

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early date. The Canadian Pacific railway has placed an order for some $5,000,000 worth of freight cars, and the Grand Trunk railway is in the equipment market for considerable rolling stock. The Canadian National railways has also given a contract for 20 locomotives; and the British Columbia government has ordered three locomotives for the Pacific & Southeastern railway. Builders of railroad equipment in Canada are looking forward to a big year insofar as equipment orders are concerned. This doubtless will call for the purchase of large quantities of machine tools.

Both in Toronto and Montreal machinery and machine tool dealers report considerable activity, with the demand for nearly all classes of tools, both new and second hand, in a brisk state. W. F. Hamlyn, Belmont, Ont., is in the market for sawmill equipment. The Windsor Petroleum & Refining Co., Ltd., 423 Drummond building, Montreal, Que., is in the market for tubular return boilers, one vertical boiler, and one Smith concrete mixer. The St. Marys Wood Specialty Co., Ltd., St. Marys, Ont., wants a portable forge, preferably oil burning. The Porcupine Pulp & Lumber Co., Ltd., Hoyle, Ont., is asking for a 16 to 22 slide valve steam engine. John E. Earle, Faversham, Ont., is in the market for a portable sawmill.

Special Crane Awards Noted in New York

Gilbert & Barker Mfg. Co., Springfield, Mass., placed a 10-ton overhead crane with the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y. This crane builder likewise received an order from the American Car & Foundry Co., New York, for seven 10-ton, four 3-ton and two 5-ton hoists. Stone & Webster placed a 50-ton overhead for Lowell, Mass., with the Cleveland Crane & Engineering Co., while the New England Structural Co., Everett, Mass., awarded a 25-ton electric crane to the Shaw Crane Works, Muskegon, Mich.

Career of James Gayley

(*Concluded from Page 723*)

causes of variations in the working of a blast furnace and of inequality in its product, is found in the greater or less percentage of moisture in the blast. It was well known that this inequality was due to the variable humidity of the blast, but such vicissitudes of furnace working were accepted as inevitable until Mr. Gayley conceived the idea of drying the air by taking the water out of it.

Mr. Gayley was probably the most highly qualified technical expert among those prominent in the steel industry. When the merger which created the United States Steel Corp. was formed in 1901, he was made first vice president, and carried into the larger organization not only an invaluable experience, but the confidence and influence of Andrew Carnegie and the capitalists who then associated themselves with the business. His work was of a most important character in having charge of the department of raw materials and their transportation.

He was a member of the American Institute of Mining Engineers, of which he served as president from 1904 to 1906, and he was also a member of the American Iron and Steel institute, the British Iron and Steel instituet, the Engineers' club and other organizations.

Mr. Gayley's contributions to technical literature during the past 25 years have been numerous and important and are found chiefly in the transactions of the American Institute of Mining Engineers, the British Iron and Steel institute, and other American and foreign societies of which he was a prominent and honored member. Among his contributions to transactions of the American Institute of Mining Engineers are "A Chilled Blast Furnace Hearth"; "Development of American Blast Furnace, with Special Reference to Large Yields"; "The Preservation of the Hearth and Bosh Walls of the Blast Furnace"; and "Application of Dry-air Blast to the Manufacture of Iron."

In 1912 the University of Pennsylvania and Lehigh university conferred upon him the honorary degree of doctor of science. He was awarded the Elliott Cresson medal by the Franklin Institute of Philadelphia in 1908 and the Perkin medal in 1913. in 1902 Mr. Gayley presented to Lafayette college, Gayley hall, for the study of chemistry and metallurgy.

Business Changes Recently Announced by the Trade

THE plant and business of the Simplex Machine & Tool Co., Columbus, O., was taken over by the Buckeye Drill & Lathe Co., that city recently. The plant and buildings were transferred by the Guaranty Title & Trust Co., Cleveland. Advices from Richmond, Ind., state that the Buckeye company also has taken over the property of the Simplex company in that city.

* * *

The Yale and Towne Mfg. Co. has sold its 12-story office building at 911 East Fortieth street, New York, and will vacate immediately the basement, store and five floors which it now occupies, with the exception of the top floor which will be used for executive offices in New York. The store and ground floor which were used for display purposes, originally were fitted up in a most elaborate manner.

* * *

J. K. Larkin & Co., have removed their executive and sales offices to 253 Broadway, New York City.

* * *

The Anderson Forge & Machine Co., Detroit, has changed its name to the Jefferson Forge Products Co., increasing its capital from $700,000 to $1,000,000. C. E. Wade is vice president and general manager.

* * *

Morrison & Risman, jobbers in iron, steel and railroad track equipment, with warehouses at Buffalo, N. Y., announce the change in the firm name to The Morrison & Risman Co. S. Morrison and S. Risman will continue in the active management and there will be no change in the membership of the firm.

* * *

The Chesapeake Iron Works, Baltimore, has changed its New York offices from the seventh to the fifteenth floor of the Woolworth building. H. L. Mode is in charge.

* * *

The Black & Decker Mfg. Co., Towson Heights, Baltimore, has opened a permanent office and show room at 1436 South Michigan avenue, Chicago, in charge of R. G. Ames.

The "Peak" of Service

Tin shop of the Dunwoodie Institute, Minneapolis, Minnesota.

Kreodone EVERLASTING **WOOD BLOCK FLOORS**

THE *old* way—a brick or cement floor, crumbly, cold, cracked, dusty, uneven, full of hills and valleys—even ravines; a wood plank floor, slippery, splintery, rotting at the edges and unsanitary, or, just a plain, untreated wood block floor which bulged and got messy and only had the shade of an advantage over the other types.

The *new* way—a KREODONE Wood Block Floor, made of long-leaf yellow pine thoroughly treated with the best *PURE* creosote oil known to science.

Over 20 years of service have proved this the correct formula for a successful factory floor.

A Kreodone floor is smooth, resilient, restful and offers a perfect foothold. It is sanitary, dust, water, and oil proof, noiseless, level, warm in winter, cool in summer, non-bleeding, will not warp, economical, cannot pit, split or splinter—and it is *permanent*.

Set in pitch to make one unit, a KREODONE Wood Block Floor will outlast any man's lifetime. Its effect on production makes it a necessary economical investment in every plant.

Let us send our specifications for any floor space you wish to cover. Send us the figures.

Get the Genuine KREODONE Blocks
Watch that Spelling—It Means Service

Republic Creosoting Company, Indianapolis, Indiana

Plants: Indianapolis Minneapolis Mobile Seattle Norfolk

BRANCH OFFICES:

315 Peoples Gas Bldg., Chicago
206 Erie County Bank Bldg., Buffalo
152 Bay Street, Toronto, Canada
638 Old South Bldg., Boston, Mass.
Berkley Ward, Norfolk
222 Society for Savings Bldg., Cleveland
834 Real Estate Trust Bldg., Philadelphia
828 Plymouth Bldg., Minneapolis
445 Central Bldg., Seattle
Masonic Temple, Mobile
211 Hammond Bldg., Detroit
735 M & M Bank Bldg., Milwaukee

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

CLARKS MILLS, ME.—The Clark Powerhouse Co. will erect a 1-story, 40 x 180-foot power house and a dam at an estimated cost of $800,000.

SOMERSWORTH, N. H.—The Great Falls Mfg. Co. has let the contract for a 4-story, 144 x 1850-foot mill and a boiler house to contain high-pressure water tube boilers burning oil. New machinery will be installed.

BOSTON.—The William E. Rice estate will build a machine shop containing 44,000 square feet of floor space.

BOSTON.—The Abba Tool & Machine Corp. has been incorporated with $50,000 capital, by Erik Jansson, Carl Worthen and Emil Carlson.

BOSTON.—The Hopkins Mfg. Co. has been incorporated to build machines with $30,000 capital, by Alfred Hopkins, George W. Robinson, Brookline, Mass., and Jacob Polisner.

BOSTON.—T. J. Edwards, Inc., has been incorporated to make steel and brass dies, with $12,000 capital, by Herbert E. Edwards, T. J. Edwards, Melrose, Mass., and C. G. Herbert.

BOSTON.—The McMurrer Co. has been incorporated to make boilers, radiators, etc., with $50,000 capital, by R. E. Johnston, Peter J. McMurrer, Everett, Mass., and Charles O. Hosterman.

BOSTON.—The B. & W. Specialty Mfg. Co. has been incorporated to make electrical fixtures and appliances with $25,000 capital, by Samuel T. McQuarrie, Hosea E. Bowen and George H. Bowen.

BOSTON.—The New England Foundries, Inc., has been incorporated to operate a foundry and machine shop, with $100,000 capital, by E. A. Tutein, Winchester, Mass., Herbert A. White, Stoughton, Mass., and A. H. Cahill, Malden, Mass.

CHARLESTOWN, MASS.—The navy department has let a contract for a 40 x 470-foot extension to foundry building, 42-C, at the navy yard, to cost about $174,000.

FALL RIVER, MASS.—The G. H. Lamoureux Co., Inc., has been incorporated to make automobiles and parts, with $25,000 capital, by M. W. Lamoureux, G. H. Lamoureux and F. F. Bergeron.

FALL RIVER, MASS.—Work has been started on a boiler house for the King Phillip Mills, two stories, 48 x 80 feet. H. S. Chase is engineer.

FORE RIVER, MASS.—The Bethlehem Shipbuilding Co. is taking bids for a new shipbuilding slip and bulkhead at Quincy, Mass.

HOLYOKE, MASS.—The Burr Appliance Co. has been incorporated to make mechanical and electrical equipment with $250,000 capital, by Charles F. Munder, Springfield, Mass., Charles D. Heywood and R. L. Davenport.

LOWELL, MASS.—The Lowell Gas Light Co. plans a boiler house addition at an estimated cost of $60,000.

PLYMOUTH, MASS.—The Edes Mfg. Co., manufacturer of zinc products, plans a 2-story, 52 x 87-foot plant.

SALEM, MASS.—The Fred E. Southard Co. has been incorporated to make hardware, carpenters' and machinists' tools, with $3000 capital, by H. V. Hayden, Fred E. Southard and F. D. Southard.

SPRINGFIELD, MASS.—The Moore Drop Forge Co. has let the contract for a 53 x 53-foot plant and office building to cost $35,000.

SPRINGFIELD, MASS.—The New England Tool & Machine Co. has been incorporated with $25,000 capital, by Max J. Cohen, Chicopee Falls, Mass., Harold J. Craig and Walter Hogarth.

SPRINGFIELD, MASS.—The Alden-Napier Co. has been incorporated to do a general molding and hardware business with $50,000 capital, by Milton Alden, Charles Napier, saw manufacturer, and E. W. Carman.

WINCHESTER, MASS.—The Bay State Saw & Tool Co. contemplates a factory addition.

BRIDGEPORT, CONN.—The Bridgeport Pattern Model Co. plans a 2-story, 40 x 100-foot plant.

BRIDGEPORT, CONN.—The Inter-American Engineering Corp. has been incorporated with $250,000 capital, by E. N. Goodwin and A. E. Bristol, Glen Ridge, N. J., and Sidney Mattison.

FAIRFIELD, CONN.—The Bullard Machine Tool Co., Bridgeport, Conn., has let the contract for a 70 x 208-foot forge shop, to cost $90,000.

HARTFORD, CONN.—The Frasse Steel Co. will take bids soon for a 3-story building addition, to cost $100,000.

MERIDEN, CONN.—Bids close soon for a 4-story, 52 x 90-foot extension to the plant of the Miller Bros. Cutlery Co.

NEW HAVEN, CONN.—The William Schollhorn Co., pliers and tools, will erect a 4-story, 31 x 40-foot extension.

NEW HAVEN, CONN.—The Lyons Level & Tool Co. has been incorporated with $30,000 capital, by G. W. Lyons, Ernest Gregory and J. W. Moffett.

NEW HAVEN, CONN.—The New Haven Iron & Metal Co., Inc., has been incorporated with $25,000 capital, by William Alderman, A. N. Alderman and M. A. Alderman.

NORWALK, CONN.—The T. F. Foley & Co., Inc., has been incorporated to do general engineering, with $25,000 capital, by T. F. Foley, C. R. Chariott and J. F. McMahon.

PLAINVILLE, CONN.—The Peck Spring Co. has been incorporated to make springs and small hardware, with $75,000 capital, by D. C. Peck, D. K. Peck and others.

North Atlantic States

BUFFALO.—The Pattern Mfg. Co. recently was incorporated with $100,000 capital, by W. Niblock, J. R. Nelson and G. A. Brown.

BROOKLYN, N. Y.—Knorr Bros., metal barrels, 1112 Wyckoff avenue, have awarded a contract for a plant to cost $30,000.

ELMIRA, N. Y.—The Elmira Foundry Co. has awarded contracts for plant additions.

LONG ISLAND CITY, N. Y.—The Astoria Light, Heat & Power Co. plans a gas generating plant, to cost $150,000.

NEW ROCHELLE, N. Y.—The Alloy Foundry & Machine Corp. recently was incorporated with $50,000 capital, by W. E. Wolheim, J. Grave and A. C. Wakeling.

NEW YORK.—The Perth Amboy Dry Dock Co. plans a machine shop.

NEW YORK.—The Universal Metal Spinning & Stamping Co. is having plans drawn for alterations to its plant to cost $10,000.

NEW YORK.—The Beacon Enameling Corp. has been incorporated with $5000 capital, by F. W. Peterson, C. C. Freese and H. C. Harris, 1475 Broadway.

NEW YORK.—The General Metal Products Co. recently was incorporated with $10,000 capital, by M. and B. and B. R. Elline, 831 Lafayette avenue.

NEW YORK.—Anton Heiss & Co., wagon and auto bodies, has been incorporated with $6500 capital, by A. I. Heiss, F. Wegmann and J. Juttner, 529 East 135th street.

NEW YORK.—The Reliance Marine Equipment Co. recently was incorporated with $50,000 capital, by C. R. Sundberg, J. M. Golden and J. Reid, Hotel Manhattan.

NEW YORK.—The General Auto Lock Corp. has been incorporated with $8000 capital, by A. M. McGiff, H. H. Chinsky and S. Heitel, 850 Hewitt place.

NEW YORK.—The Crescent Diamond Die Corp. recently was incorporated with $25,000 capital, by S. Mendel, R. Herschman and D. Wolf, 45 East Seventeenth street.

NEW YORK.—The Continental Lamp Works recently was incorporated to make lamps, with $20,000 capital, by T. P. Vilaghy, L. Demeter and I. J. Lynch, 574 West 192nd street.

NEW YORK.—The Hampton Engineering Co. has been incorporated with $15,000 capital to make motors, engines, etc., by L. C. Cocheu, S. S. and S. F. Hampton, 6 Wall street.

NEW YORK.—The Erco Machine Corp. has been incorporated with $20,000 active capital, by W. M. Schwartz, M. P. Breen Jr., and R. S. Mazzola, 128 Broadway.

NEW YORK.—The Harriman Products Co. have been incorporated with $50,000 capital to manufacture auto and airplane parts, by J. L. Marshall,

SIVYER S CASTINGS

Sivyer Steel tee connection used on Heine boilers

The Sivyer Service of providing Electric Steel Castings has for its objects the decrease of machining costs and the increase of wearing-quality and life. Both are attained by methods which result from long experience and begin with the design of the casting itself When we find that a casting we are asked to furnish is of a design not consistent with good foundry practice, we study its function in the completed unit and offer the necessary suggestions to make it a really practicable casting job without affecting in any way its function and efficiency.

Secondly: Sivyer Service analyzes the functions of the casting and specifies the proper composition steel for the job; long experience with carbon and alloy steels has enabled us to reduce costs and increase quality remarkably for many different industries.

Thirdly: Sivyer Service makes a careful study of the pattern and molding problems involved, for improper gating and insufficient risers are often the greatest wasters of machining labor and metal.

Fourthly: Sivyer Service analyzes carefully the proper annealing methods to be used and controls their proper application through unfailingly efficient equipment and men. In short, the Sivyer Service supervises every step necessary to secure unusually and unfailingly good castings of electric steel. It never relies on one factor alone, relies very little even on the natural freedom of electric steel from occluded gases and on its commonly recognized merits in resisting crystallization. It also depends but little on the inherent scientific accuracy of the electric furnace process. From casting-design to sand-blasting and tumbling, the fundamental superiority of Sivyer Steel is due to its men and metal. Their value is best proved by the fact that, although the production of steel castings is generally looked upon as a local one, the Sivyer market is national.

STRAINS imposed by steam pressures ranging from 200 to 350 pounds per square inch, and the maintenance of high factors of safety, demand for high pressure boiler construction metal parts positively sound and certain in strength. All fittings must be made of a close-grained metal absolutely free from flaws. Because Sivyer Electric Steel best satisfies these requirements the Heine Safety Boiler Co. is using Sivyer Steel Castings for tee connections. Special gating, heading and pouring methods were devised by Sivyer to assure the perfection of these parts. The dense texture of Sivyer Electric Steel and the painstaking thoroughness of Sivyer methods — the specific ability to meet exacting conditions —these factors have aided in winning for Sivyer Castings their nation-wide market.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

W. L. Moseley and G. V. Harriman, 34 Vermilyea avenue.

OSWEGO, N. Y.—The Arceo Anti-Rail Creeping Co., tools, etc., has been incorporated with $9000 capital, by A. J. Dinkiage, F. B. Tracy and J. R. Steele.

PHELPS, N. Y.—The Phelps Foundry Co. has been incorporated with $50,000 capital, by W. R. Shavor, T. Jones and C. P. Downs of Rochester, N. Y.

PORT WASHINGTON, N. Y.—The Port Washington Shipyard & Motor Co. has been incorporated with $30,000 capital, by A. Walker, E. V. Willis and F. M. Caughey.

ROCHESTER, N. Y.—A. H. Boyce, 160 East avenue, has had plans prepared for a 2-story machine shop, 64 x 195 feet, to cost $35,000

ROME, N. Y.—The Rome Wire Co. recently purchased the equipment of the insulated wire department of the B. F. Goodrich Co., Akron, O., for installation in a branch factory in Buffalo.

SENECA FALLS, N. Y.—The Radder Vending Machine Co. has been incorporated with $75,000 capital, by H. Goodnough, H. H. and O. C. Radder.

CARLISLE, PA.—The Carlisle Foundry Co. has been incorporated with $50,000 capital, by C. S. Brinton, Thomas McDonald and N. C. Righter.

CHESTER, PA.—Allison & Co., forging furnaces, etc., has had plans prepared for a 1-story plant addition, 60 x 200 feet, to cost $200,000.

EXETER, PA.—The Exeter Machine Works is planning a foundry, 50 x 150 feet, to cost $70,000.

HARRISBURG, PA.—The Elliot-Fisher Co., billing machines, etc., is reported planning a new plant.

HOLMESBURG JUNCTION, PA.—The Precision Grinding Wheel Co. has prepared plans for a 1-story building, 96 x 298 feet.

LEWISTON, PA.—The plant of the Mann Edge Tool Co. recently was damaged by fire.

MECHANICSBURG, PA.—The plant of the Eberly & Orris Mfg. Co., wagon parts, etc., recently was damaged by fire. It will be rebuilt.

MILLERSBURG, PA.—The Alvord Reamer Co. has had plans drawn for a machine shop, one story, 40 x 80 feet.

MONACA, PA.—The Beaver Valley Alloy Foundry Co. has been incorporated with $30,000 capital, by Charles E. Coleman, William S. Porster, Rochester, Pa., and Clifford S. Marshall, Corapolis, Pa.

MOORE, PA.—The Dupont Motors, Inc., which was recently formed, is reported planning a plant here.

PHILADELPHIA.—Gillinder & Sons, Inc., are reported planning a machine shop at a cost of $20,000.

PHILADELPHIA.—Kruse & Slattery, 730 Cherry street, tools, etc., have had plans prepared for a 2-story plant, 50 x 100 feet, to cost $25,000.

PITTSBURGH.—The McKenna Brass & Mfg. Co. is reported planning plant extensions.

PITTSBURGH.—Architects Rubin & VeShancey are preparing plans for a blacksmith shop. The name of the owner is withheld.

PITTSBURGH.—The Pittsburgh Bronze Casting Co. has been incorporated with $50,000 capital, by Carl P. Seyler, Carl J. Setler and George M. Hosack.

PITTSBURGH.—The Kenney Mfg. Co., tools, dies, etc., has been incorporated with $20,000 capital, by Richard M. Kenney, A. C. Pierce and John J. Kenney.

WAYNESBORO, PA.—The Victory Tool Co. has had plans prepared for a machine shop addition to cost $12,000.

YORK, PA.—The Standard Body Co. has been incorporated with $100,000 capital, by Alvin F. Fix, Almer A. Schriver and Frank P. Lauer.

HAMILTON, N. J.—The Trenton Patent Mfg. Co., piston rings, etc., has been incorporated with $20,000 capital, by W. H. Jaeger, William Leedom and D. A. Yergy.

HOBOKEN, N. J.—W. H. Atkinson Co. plans a machine shop, one story, 68 x 142 feet, at an estimated cost of $25,000.

IRVINGTON, N. J.—The Vreeland Motor Co., temporarily located on Elizabeth avenue, will erect a new plant. The first unit will be 280 x 300 feet.

NEWARK, N. J.—For the establishment of a new plant, the E. Behringer Sheet Metal Works, Inc., has purchased property, consisting of a 2-story, 100 x 125-foot brick building.

TRENTON, N. J.—The plant of the Peerless Crescent Insulated Wire & Cable Co. recently was damaged by fire.

TRENTON, N. J.—The Trenton Steel & Wire Co. has been organized with $100,000 capital, by T. A. and Duncan MacKenzie and Edward J. Scudder, to engage in the manufacture of wire and steel products.

WEEHAWKEN, N. J.—The plant of the Sterling Bobbin Works recently was damaged by fire.

WILLIAMSTOWN, N. J.—A. W. Straub Co., grinding machinery, will erect a plant.

BALTIMORE.—The Globe Shipbuilding Co is now awarding contracts for its new plant, to be erected at Fairfield.

BALTIMORE.—The Caroline Foundry Co., 723 South Caroline street, has awarded a contract for a 1-story plant addition, 60 x 106 feet, to cost $10,000.

BALTIMORE.—The King Electric Washing Machine Co., 217 West Saratoga street, has been incorporated with $100,000 capital, by M. V. Mueller, Charles L. Houck, W. J. Baeschke, Charles C. Schaefer and William J. Stein.

BALTIMORE.—Plans have been announced by the Columbia Graphaphone Factories Corp. of Maryland for its proposed $3,600,000 plant, to be erected here. The works will comprise 10 buildings, including a 6-story, 260 x 380-foot main structure. Other buildings to be erected include two machinery buildings, two dry kilns, grinding department, warehouse, and disc record building. A site of 117 acres has been purchased.

SPARROWS POINT, MD.—The Bethlehem Steel Corp. has prepared plans for additions to its local plant. The new units will include a power house and sheet metal, joiner and pipe shops.

MANASSAS, VA.—The Winding Gulf Colliery Co. contemplates rebuilding its machine shop which was recently damaged by fire. The building will be one story, 50 x 148 feet, and cost $30,000.

Central States Activity

FOND DU LAC, WIS.—The Sanitary Refrigerator Co. is having plans prepared for several additions and has increased its capital from $200,000 to $300,000.

KENOSHA, WIS.—Bids will be received by the assessment commission, city hall, for a bridge to cost $400,000.

KENOSHA, WIS.—The W. J. Pine Machine Co. has purchased the building which it has occupied for some time, and plans several additions. Plans are being drawn.

MADISON, WIS.—Contracts have been awarded by the Gisholt Machine Co. for an addition to its gray iron foundry, 115 x 200 feet.

MILWAUKEE.—Doelger & Kirsten plan a machine shop, one story, 90 x 200 feet.

MILWAUKEE.—R. J. Schwab & Sons Co., furnace and boiler manufacturers, plans a 2-story plant addition, 48 x 50 feet.

MILWAUKEE.—Articles of incorporation have been filed by the Peterson-Billker Tool & Machine Co. The capital stock is $15,000 and the incorporators are Felix Mayer, Fred Billker and Hans Peterson.

OSHKOSH, WIS.—The Dauber Bell Machinery Co. is having plans drawn for a machine shop addition, two stories, 46 x 48 feet, to cost $12,000.

OSHKOSH, WIS.—The Molle Typewriter Co. has let the contract for a 2-story plant addition, 50 x 155 feet, to cost $75,000. R. D. Wynn is general manager.

ALLEGAN, MICH.—Standard Steel Box Co. has been incorporated for $15,000 by Geo. H. Hurteau and others to manufacture sheet metal products.

BAY CITY, MICH.—General Motors Corp. contemplates a $500,000 malleable iron foundry at Essexville.

BENTON HARBOR, MICH.—Moulds Brass Foundry Co. has been chartered for $10,000 by Wm. Moulds and others.

DETROIT.—Simplex Tool & Mfg. Corp., has been chartered for $10,000 by Charles Salerno, 70 Blaine avenue, and others, to manufacture jigs, tools and dies.

DETROIT.—United Automatic Screw Works has been incorporated for $25,000 by Frank Bazan, 175 Central avenue, to manufacture screws, bolts, nuts, dies and machine tools.

DETROIT.—George W. Brown, 26 California avenue, and others have organized Dell & Co., with capital stock of $50,000, to manufacture tools and metal stampings.

DETROIT.—Unitas Engineering Co. has been incorporated for $10,000 by George Valvio, Royal Oak, Mich., and others, to manufacture stampings and machine parts.

DETROIT.—Sterling Equipment & Supply Co. has been chartered for $10,000 by Wm. M. Frank, 420 Sherman street, for general machinery and boiler repair work.

DETROIT.—B. H. & M. Machine & Tool Co. has been incorporated for $25,000 by Charles A. Baker, 535 Chene street, and others, to conduct a general machine and pattern shop.

ESSEXVILLE, MICH.—The Flint Foundry Co. is reported planning to erect a foundry here at an estimated cost of $500,000, providing the company is given a plant site and a stock subscription of $100,000.

FLINT, MICH.—Armstrong Spring Works, subsidiary of Standard Parts Co., Cleveland, will enlarge production by erection of new units.

FLINT, MICH.—Standard Iron & Steel Co. has been incorporated for $30,000 by Hyman Bergman and others to deal in scrap iron and metals.

HOWELL, MICH.—The Spencer-Smith Machine Co. has increased its capital stock to $200,000 to permit extensive plant additions.

KALAMAZOO, MICH.—Kalamazoo Sedan Co. has been organized with capital stock of $150,000 to manufacture sheet metal and wood automobile tops by C. C. Bobb and others.

LUDINGTON, MICH.—Handy Things Mfg. Co. has been incorporated for $50,000 by A. M. Hicks and others to manufacture metal specialties.

MANISTEE, MICH.—Manistee Steel Products Co. has been incorporated by Henry Wolfe and others, with $100,000 capital, to manufacture pressed steel products.

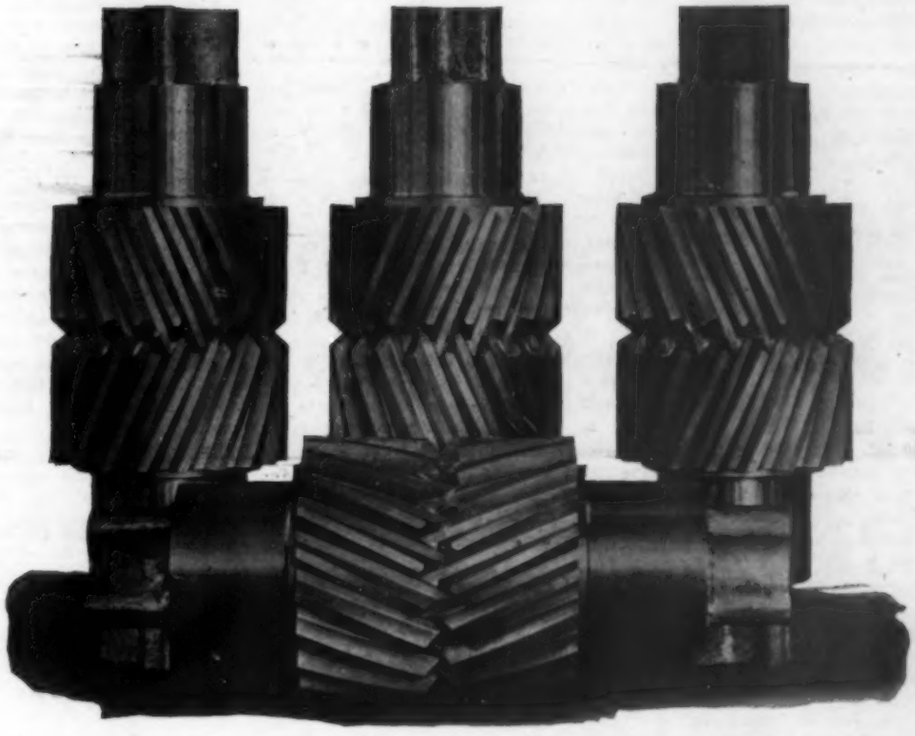
SAGINAW, MICH.—Saginaw Hardware Co. has been organized by F. C. Achard and others, with capital stock of $200,000.

AURORA, ILL.—Architect Frank B. Gray, Coulter building, is drawing plans for a power plant addition to cost $15,000. The name of the owner is withheld.

BELLEVILLE, ILL.—The plant of the Harrison Machine Works recently was damaged by fire.

CHICAGO.—The Alemite Die Casting & Mfg. Co. has bought a site on which it will build a plant.

Gears for All Types of Rolling Mill Service



Open Hearth Steel Castings
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Combine high efficiency, great reliability and long wearing quality with low upkeep.

These advantages, and many others can be derived from an installation of Falk Herringbone Gears.

Steel Castings from 1 to 100,000 lbs.

Write for Particulars

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PITTSBURGH, W. O. Beyer, 1007 Park Building
SAN FRANCISCO, F. W. Grimwood, Rialto Bldg.
NEW YORK, M. P. Fillingham, 50 Church Street
DENVER, COLO., Denver Engineering Works
WILKES-BARRE, PENNA., Vulcan Iron Works

with 100,000 square feet of floor space, costing $100,000.

CHICAGO.—The Frium Drop Forge Co. contemplates a plant.

CHICAGO.—The Advance Pattern & Foundry Co. has a permit to erect a plant addition.

CHICAGO.—The Standard Steel Casting Co., 910 South Michigan avenue, has awarded a contract for an addition to cost $200,000.

CHICAGO.—The Accessories Mfg. Co., manufacturer of electric specialties, contemplates a 2-story plant, to cost $48,000.

CHICAGO.—The Hy-Speed Wrench Co., 2614 West Forty-eighth street, contemplates a machine shop 1-story, 125 x 125 feet, to cost $38,000.

CHICAGO.—The Republic Flow Meter Co., 556 Washington boulevard, has a permit to erect a plant at an estimated cost of $80,000.

CHICAGO.—The De Vry Corp., 1248 Marianna avenue, will build a 3-story plant, 80 x 200 feet, to cost $100,000.

CHICAGO.—W. P. Bowers, 18 West Kinzie street, will build a 5-story manufacturing building, 29 x 110 feet, costing $12,000.

CHICAGO.—The Flexible Steel Lacing Co. will erect a 1-story factory building, at a cost of $160,000.

CHICAGO.—Architect C. W. Lampe, 155 North Clark street, is preparing plans for a machine shop to be 1-story, 40 x 50 feet, and to cost $10,000. The name of the owner is withheld.

DECATUR, ILL.—A large foundry company, now being organized, has an option on the plant of the Alfo Products Co. In addition to the present plant, an additional structure will be erected.

ELGIN, ILL.—The plant of the William A. Field Tool Mfg. Co. has been damaged by fire.

PEORIA, ILL.—The Peoria Malleable Castings Co. has increased its capital from $175,000 to $250,000 and will enlarge its plant.

ROCKFORD, ILL.—The A. P. Harder Furnace Co. has been incorporated with $300,000 capital, by A. P. Harder, C. F. Henry and Howard J. Bannen.

ROCKFORD, ILL.—The Rockford Malleable Iron Works has awarded a contract for a core room, 44 x 52 feet.

ANDERSON, IND.—Commissioners of Madison county have approved bonds for a bridge across White river, costing $134,000.

CROTHERSVILLE, IND.—The Crothersville Water & Electric Co. has been incorporated with $50,000 capital, by W. P. Rider, C. W. Keach and H. B. White.

DECATUR, IND.—A power plant, costing $75,000, will be built by the city.

EAST CHICAGO, IND.—The Sinclair Refining Co., John Hess, chief engineer, will build a refinery.

EVANSVILLE, IND.—The Hoosier Ice Machine Works, capitalized at $15,000, has been chartered to manufacture refrigerating machinery, by M. P. Alexander, A. B. Alexander and G. A. Condit.

FRANKLIN, IND.—The Hoosier Wheel Co. plans a 1-story plant, to cost $15,000.

GARY, IND.—The Leonard Tractor Co., capitalized at $2,000,000, will start soon on a plant.

GARY, IND.—The Panic Proof Products Corp., New York, has purchased the Gary plant of the Central Metallic Door Co., and will erect additions.

HAMMOND, IND.—The Eclipse Auto Body Mfg. Co. is having plans prepared for a machine shop, one story, 42 x 72 feet, to cost $12,000.

INDIANAPOLIS.—The Acme Aluminum & Brass Works, 420 South Harding street, will increase its capital and enlarge its plant.

INDIANAPOLIS.—David N. Ross, Inc., has been incorporated with $10,000 capital to manufacture dies, etc., by David N. Ross, C. D. Ross and D. A. Alig.

INDIANAPOLIS.—The Apex Mfg. Co. has been incorporated with $10,000 capital to manufacture machinery, by John Murphey, George Shepherd and F. J. Montant.

KENDALLVILLE, IND.—The Kendallville Foundry Co. is taking bids for a foundry to cost $30,000.

KOKOMO, IND.—The Lava Metal Co. has been incorporated with a capital of $20,000 by Ollie H. Buck, David C. Jenkins and L. B. Hodgin.

LAFAYETTE, IND.—The Metal Basket Works, capitalized at $100,000, has been chartered by W. F. Sheets, J. F. Bellinger and W. S. Crum.

MUNCIE, IND.—The Indiana Foundry Co. is building a new plant, 150 x 200 feet, at a cost of $75,000.

MUNCIE, IND.—A company is being formed here which plans to erect a foundry to be 75 x 100 feet. Those interested can be reached through Judge W. A. McClellan, Vettet building.

TERRE HAUTE, IND.—The Columbian Enameling & Stamping Co. plans a plant, one story, 155 x 240 feet, to cost $50,000.

CANTON, O.—The Canton Pattern & Mfg. Co. has been incorporated with $100,000 capital, by T. M. Dubs, E. R. Starkey and others.

CINCINNATI.—The David Welding Mfg. Co. plans a plant at an estimated cost of $150,000.

CINCINNATI.—The Karl Klufer Machine Co. contemplates a plant, two stories, 50 x 150 feet.

CINCINNATI.—The Cincinnati Fixture Foundry Co. recently was incorporated with $30,000 capital, by P. T. Fruechtemeyer, W. G. Brown and others.

CINCINNATI.—The Fischer Specialty Mfg. Co., 2078 Reading road, contemplates a plant, to cost $100,000.

CLEVELAND.—The Auer Register Co. contemplates a plant, two stories, 75 x 100 feet, to cost $100,000.

CLEVELAND.—The Albra Castings Co. recently was incorporated with $10,000 capital, by R. L. Welsh, S. F. Dolezal and others.

CLEVELAND.—The Cleveland Cylinder Regrinding Co. has been incorporated with $20,000 capital, by C. H. Sandberg, A. M. Sandberg and others.

CLEVELAND.—The Delta Machine & Tool Co. has been incorporated with $10,000 capital, by S. C. Boim, Joseph Engel and others.

CLEVELAND.—The Manufacturers Foundry Co. recently was incorporated with $500,000 capital, by William Finn, A. Kyle and others.

CLEVELAND.—The Hardening Process Aluminum & Copper Co. has been incorporated with $25,000 capital, by H. M. Buluckian, Cap Gagdasarian and others.

CLEVELAND.—The West Steel Casting Co., 805 East Seventieth street, contemplates an addition to its foundry, 100 x 150 feet, to cost $80,000.

COLUMBUS, O.—The Columbus Malleable Iron Co. is reported planning a plant extension.

COLUMBUS, O.—The Safety Foot Guard & Railway Appliance Co. is erecting a plant here. It has offices in the Hartman building.

TOLEDO, O.—The Burt Foundry Co. plans a foundry addition, 60 x 100 feet, to cost $35,000.

CHARLESTON, W. VA.—The Gilmore Mfg. Co. has been incorporated with $500,000 capital to manufacture auto bodies, by George W. McClintic and others.

MANNINGTON, W. VA.—The Phillips Tool Co. is reported planning plant additions.

PLEASANTON, W. VA.—The Wheeling Machine Products Co. will erect a machine shop, one story, 40 x 80 feet.

In The South

HARLAN COUNTY, KY.—The Black Mountain Coal Co. will install a 200,000-ton coal storage plant.

LOUISVILLE, KY.—The Visible Measure Gasoline Dispenser Co. is said to be planning a plant addition.

LOUISVILLE, KY.—The Atlantic Tank & Barrel Co. has a building permit for a plant addition to cost $25,000.

LOUISVILLE, KY.—The Kentucky Wagon Mfg. Co. has purchased land adjoining its plant, and is reported considering the erection of additional buildings.

KNOXVILLE, TENN.—The Shearman Concrete Pipe Co., manufacturer of reinforced concrete pipe, has applied for a charter. It will be capitalized at $75,000 and the incorporators include W. S. Roberts, A. N. Shearman, R. S. Lauder, Scott Hamilton and W. H. Shaver.

MEMPHIS, TENN.—The Southern Automobile Mfg. Co., recently organized, has purchased a 7-acre site here, and will invest $250,000 in factory buildings and mechanical equipment.

NASHVILLE, TENN.—The Tri-State Armature Works has applied for a charter with $50,000 capital. The incorporators are W. S. Gaden, G. S. Gaden, W. A. Lanahan, L. C. Swafford and R. A. Reed.

ELIZABETH CITY, N. C.—The Elizabeth City Iron Works & Supply Co. plans two buildings to be used as shipbuilding and repair plants.

ELIZABETH CITY, N. C.—The Gordon Bean & Pea Harvester Co., manufacturer of harvester machines, has been incorporated with $50,000 capital, by L. S. Gordon, W. G. Gaither and W. P. Wood.

ST. PAULS, N. C.—The St. Pauls Cotton Mill Co. and the Ernaldson Mfg. Co. plan a central power plant.

WAKE FOREST, N. C.—The Machinery & Hardware Co. has been incorporated with $50,000 capital, by R. J., W. F. and H. P. Jones.

CHARLESTON, S. C.—The Peerless Tool Co. has been incorporated with $100,000 capital, by N. L. Isenhour and J. G. Isenhour.

EDGEFIELD, S. C.—The city will spend about $80,000 in the construction of a water works plant.

PARIS, S. C.—The Cyclone Starter & Truck Co., manufacturer of trucks and automobile starters, has been incorporated with $1,000,000 capital, by Charles G. Edison, W. L. Huchins and D. B. Tracler. A plant will be erected.

ALBANY, GA.—The Lilliston Harvester Co. has been incorporated with $200,000 capital, by J. H. Lilliston, Suffolk, Va., C. J. Rambo and J. M. Webb, both of Edison, Ga., and plans a plant for the manufacture of peanut pickers. The plant will include a machine shop and foundry.

ATLANTA, GA.—The Atlanta Safe Co. has been incorporated with $20,000 capital, by C. C., W. H. and A. A. Downs.

ATLANTA, GA.—The Crane Co. will construct a warehouse here at a cost of $120,000. It will be four stories, 100 x 100 feet.

ATLANTA, GA.—The Georgia Railway & Power Co. is considering the erection of a hydro-electric plant near Tugalo, Ga., to develop 150,000 horsepower.

ATLANTA, GA.—M. A. Ferst and Harry Gottheimer have organized the firm of M. A. Ferst, Ltd., with $5000 capital, for the manufacture of graphite products.

COLUMBUS, GA.—The Columbus Iron Works Co. will erect a 2-story warehouse.

EATONTON, GA.—The Stonecypher Electric Co. has

been incorporated and plans an electric light system.

FITZGERALD, GA.—J. H. Mayes, president of the chamber of commerce, is organizing a company which will establish an iron foundry and machine shop here.

LA GRANGE, GA.—The J. T. Rice Co. has purchased a large garage which will be remodeled into a foundry and machine shop. The company has applied for a charter with a capital of $25,000.

MACON, GA.—The Cowan-Alford Machine Corp. has been organized by W. M. Cowan and W. B. Alford. The company will manufacture a machine for boring in stumps to be dynamited and to be used for other purposes.

ROME, GA.—The power house at the Rome pumping station was recently damaged by fire. The loss has been estimated at $20,000.

SAVANNAH, GA.—The Taggart Coal Co. will build an additional coal tipple with a daily loading capacity of 2000 tons.

SAVANNAH, GA.—John, James A. and John Z. Rourke have incorporated the Rourke Dry Docks Co. with a capital stock of $50,000.

SAVANNAH, GA.—The Macharf Iron Works has a 3-acre site on which it plans a plant. The company will manufacture hardware, building and plumbing specialties, and make castings.

BIRMINGHAM, ALA.—The Chickasaw Shipbuilding & Car Co. will build a plant for the manufacture of steel cars and frames.

BIRMINGHAM, ALA.—The Minuet Change Lever Co. has been incorporated with $100,000 capital, by P. L. Mumford and Percy Copion.

BIRMINGHAM, ALA.—The Birmingham Steel Corp. is reported considering the establishment of additional facilities for manufacturing ship and steel shapes.

CHEROKEE BLUFF, ALA.—The Alabama Power Co., Birmingham, Ala., is reported preparing to build a hydro-electric plant near here.

MOBILE, ALA.—The Mobile Shipbuilding Co. has announced its present capacity will be increased from 25 to 40 per cent.

ONEONTA, ALA.—Thomas Worthington & Co. will install steam shovels, washers, etc., at Talts Gap, Ala., to mine iron ore. About $100,000 will be invested in the project.

PRATT CITY, ALA.—The Tennessee Coal, Iron & Railroad Co. plans development of the Hamilton Slope mine.

CLARKSDALE, MISS.—The Clarksdale Machinery Co., J. H. Hooks president, has had plans made for a 1-story machine shop 100 x 162 feet.

JACKSONVILLE, FLA.—The Florida Iron Bed Co. has been incorporated with $100,000 capital, by J. C. Connally, John H. Elk and W. C. Kent. A plant will be established.

ST. ANDREW, FLA.—The St. Andrew's Bay Ways Co. has been organized to construct shipways. A 200-foot cradle is planned.

Business in Canada

BROCKVILLE, ONT.—J. G. Gardner will head a company, financed by American and Canadian capital, which will engage in the foundry business.

BROCKVILLE, ONT.—The Machinery & Foundries, Ltd., recently incorporated with $250,000 capital, will start work shortly on the erection of a plant.

CHIPPAWA, ONT.—The Ontario Smelters & Refiners, Ltd., has been incorporated to manufacture, metals, iron, steel, etc., with $750,000 capital, by Murray H. Gilliam, 773 Indian road; Morley C. van der Voort and others of Toronto, Ont.

ELMIRA, ONT.—A. Homme, Sons & Co., Ltd., has been incorporated to manufacture machinery, tools, etc., with $100,000 capital, by August Homme, McKillop, Ont., John Benneuris and George Hillebrecht.

FORD CITY, ONT.—The Gotfredson-Joyce Corp., Ltd., has been incorporated to manufacture machinery, automobiles, etc., with $100,000 capital, by Benjamine Gotfredson and Mark H. Coleman both of Detroit; Frank H. Joyce, Ford City, and others.

GODERICH, ONT.—The National Shipbuilding Co. is having plans prepared for a mill here to cost $30,000.

GUELPH, ONT.—The plant of the Taylor Forbes Co. recently was damaged by fire.

HAMILTON, ONT.—The Machinery & Supply Sales Co., Ltd., has been incorporated to manufacture machinery, engines, boilers and factory equipment, with $50,000 capital, by David T. White, Daniel L. McIntyre and George W. Bailey.

HAMILTON, ONT.—The Canadian Nathan, Ltd., has completed plans and will establish a plant here. The former plant of the Chadwick Metal Co. has been acquired and will be remodeled and equipped to handle the various products of the company, which will specialize in the manufacture of brass and metal specialties. The company also plans to carry on a general brass foundry business. The directors include J. W. Norcross, F. S. Isard and W. J. Carrigan of Montreal, Que.; M. S. Tooth and Alfred Nathan of New York; W. W. Chadwick, W. R. Dunn and George Guy of Hamilton, Ont.; and C. Secord, Toronto. The officers of the company are president, J. W. Norcross; vice president, E. S. Tooth; managing director, W. J. Carrigan; secretary-treasurer, R. F. Curtis.

KITCHENER, ONT.—Woelfle Bros., Ltd., has been incorporated to manufacture tools, etc., with $40,000 capital, by Edward E. Woelfle and others.

LONDON, ONT.—Plans are being prepared for a plant for the Ontario Spring Bed Co., King street, to cost $10,000.

LONDON, ONT.—The Canadian branch of the Detroit Gartley-Weston Co. will establish a plant for the manufacture of metal plating.

LONDON, ONT.—Barton & Rumble, 596 Hamilton road, is having plans prepared and construction will start about April 1, on an auto truck factory to cost $10,000.

NIAGARA FALLS, ONT.—G. D. Wilson and Harry Sham, 122 Buchanan street, will make alterations to their machine shop at an estimated cost of $12,000.

PETERBOROUGH, ONT.—The Canadian General Electric Co. plans to expend between $600,000 and $1,000,000 on new buildings and equipment.

SILVERTHORNE, ONT.—The building occupied by the Hope Sash Mfg. Co., Hope and Banff streets, was damaged by fire.

STRATFORD, ONT.—The Kindel Bed Co., Ontario street, is having plans prepared for a boiler house in which will be installed a 250-horsepower boiler.

ST. CATHARINES, ONT.—The McKinnon Industries, Ltd., will build an addition to its forge shop, 50 x 70 feet.

ST. CATHERINES, ONT.—The Kimber & Hillier Mfg. Co., Ltd., has taken over the building of the Woods Tannery and is installing machinery for the manufacture of dies, etc.

ST. CATHERINES, ONT.—The Walton-Carson Co., Ltd., has been incorporated to manufacture machine tools, machinery, castings, etc., with $40,000 capital, by Samuel G. Walton, Walter V. Carlson and Archibald T. Baker.

ST. CATHERINES, ONT.—The Regent Metal Goods Co., Buffalo, has leased 7500 feet of the Lord & Burnham factory here and will install machinery and equipment for the manufacture of coaster brakes, etc.

TECUMSEH, ONT.—The Windsor Petroleum Co. will build a refining plant here at an estimated cost of $250,000.

TORONTO, ONT.—Plans are being prepared for the erection of an addition to the plant of the Sangamo Electric Co., 183 George street.

TORONTO, ONT.—William & J. J. Greey, machinery manufacturers, will build additional stories to their plant at an estimated cost of $35,000.

TORONTO, ONT.—Hugh Walker, 230 Langley avenue, has been awarded the contract for a factory for the Guide Motor Co., 3 Berti street, to cost $10,000.

TORONTO, ONT.—The Republic Stamping & Enameling Co., Canton, O., has secured controlling interest in the Consolidated Stamping & Enameling Co., and will build an addition to the plant.

TORONTO, ONT.—The Tube Co. of Canada, Ltd. has been incorporated to manufacture steel and other metal tubing, with $100,000 capital, by Herbert W. Carter, Peter M. Sorley and John F. Laurson.

TORONTO, ONT.—The Canadian Reclaimers, Ltd., has been incorporated to manufacture reclaimers, tools, machinery, etc., with $50,000 capital, by Charles H. Bower, John C. Boland and others.

TORONTO, ONT.—The Dominion Shipbuilding & Repair Co., Ltd., has been incorporated to build ships, etc., with $3,000,000 capital, by Norman S. Robertson, 44 King street west; Harold L. Steele, 437 Broadview avenue, and others.

TORONTO, ONT.—The Cobb Electro Reduction Corp. of Canada, Ltd., has been incorporated to manufacture metals, iron, steel, etc., with $50,000 capital, by William J. Beattie, 44 King street west; Howard A. Harrison and others.

TORONTO, ONT.—The Canadian Wirebound Boxes, Ltd., has been incorporated to manufacture wirebound boxes, etc., with $300,000 capital, by Llewellyn A. DeLaplante, 1000 Gerrard street east; Kenneth F. MacKenzie, 85 Bay street, and others.

TORONTO, ONT.—The West Furnace Carburetor Co. of Canada has been incorporated with $100,000 capital, to manufacture furnace carburetors, accessories, etc., by William A. Gilman, Denver, Colo., Edward A. H. Martin and Thomas B. Richardson.

TORONTO, ONT.—The Automatic Telephones & Time Recorders, Ltd., has been incorporated to manufacture telephones, etc., with $40,000 capital, by Henry H. Davis, room 25, 10 Adelaide street east; John R. Rumball, 65 Charles street west, and others.

TORONTO, ONT.—The Paxor Auto & Engineering Co., Ltd., has been incorporated to manufacture marine engines, automobiles, etc., with $50,000 capital, by Ferguson J. Dunbar, room 911, 36 Toronto street; Douglas G. Lawrence, 22 Roxborough drive, and others.

TORONTO, ONT.—The Canada Metal Co., Ltd., Fraser avenue, has purchased the building of the United Brass & Lead Co., 284 St. Helens avenue, and will use it as a subsidiary to its plant. The company is also planning to erect an addition to its main plant.

TORONTO, ONT.—The Canadian National Rolling Stock, Ltd., has been incorporated by David B. Hanna, Alfred J. Mitchell, 1 Toronto street; Gerald Ruel, 127 Isabella street, and others, with $500,000 capital, to manufacture engines, locomotives, railway equipment, etc.

WELLAND, ONT.—W. J. Hickey, 119 Main street, has the contract for rebuilding a part of the plant of the Welland Iron & Brass Co., which was recently damaged by fire.

VANCOUVER, B. C.—The Wonderphone, Ltd., has been incorporated to manufacture telephone and telegraph instruments with $1,000,000 capital, by Roy G. Shrader, George E. Hancox, Frederick R. Anderson and others.

VANCOUVER, B. C.—Contract has been awarded for the construction of the first unit of a plant for the Britannia Wire Rope Co.

Iron and Steel Scrap Prices

Corrected to Tuesday Noon

Steel Works Scrap

HEAVY MELTING STEEL

Pittsburgh	$28.00 to 28.50
Chicago	24.00 to 24.50
Eastern Pennsylvania	25.00 to 26.00
Cleveland	25.50 to 26.00
St. Louis	23.00 to 24.00
Buffalo	26.50 to 27.50
New York (dealers)	20.00 to 23.00
Cincinnati	24.00 to 24.50
Birmingham	21.00 to 22.00
Valleys	27.00 to 27.25
Boston (dealers)	21.00 to 22.00
Detroit	22.00 to 22.50

BUNDLED SHEETS

Pittsburgh	$20.50 to 21.00
Eastern Pennsylvania	21.00 to 22.00
Cleveland	18.00 to 18.50
Buffalo	19.00 to 20.00
Cincinnati	18.00 to 19.00
St. Louis	15.50 to 16.00

STEEL RAILS, SHORT

Chicago	$28.00 to 28.50
Boston (dealers)	21.00 to 22.00
Cleveland	24.00 to 24.50
St. Louis	27.00 to 27.50
Birmingham	21.00 to 23.00
Cincinnati	24.00 to 25.00

STOVE PLATE

Pittsburgh	$33.00 to 34.00
Chicago	34.50 to 35.00
Eastern Pennsylvania	30.00 to 31.00
Cleveland	30.00 to 31.00
St. Louis	33.50 to 34.00
Buffalo	30.00 to 31.00
New York	29.00 to 30.00
Cincinnati	27.00 to 28.00
Birmingham	29.00 to 31.00
Boston	26.50 to 27.50
Detroit	28.00 to 28.50

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$32.50 to 33.00
Chicago, billet and bloom crops	24.00 to 25.00
Eastern Penn. (guaranteed)	32.00 to 33.00
Buffalo	32.00 to 33.00

SHOVELING STEEL

Chicago	$23.50 to 24.00
St. Louis	22.00 to 22.50

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$29.00 to 29.50
Chicago	27.00 to 27.50
St. Louis	27.50 to 28.00

BALED SHEETS

Pittsburgh	$24.50 to 25.00
Chicago	20.00 to 20.50
Detroit	19.00 to 19.50

FROGS, SWITCHES, GUARDS

Chicago	$24.00 to 24.50
St. Louis	25.50 to 26.00
Eastern Pennsylvania	25.00 to 26.00

BOILER PLATE, CUT

Chicago, No. 1	$20.00 to 20.50
St. Louis	18.00 to 18.50

ANGLE BARS—STEEL

Chicago	$27.50 to 28.00
St. Louis	26.00 to 26.50

Iron Mill Scrap

RAILROAD WROUGHT

Pittsburgh, No. 1	$33.00 to 34.00
Pittsburgh, No. 2	28.00 to 28.50
Chicago, No. 1	29.00 to 29.50
Chicago, No. 2	26.50 to 27.00
Eastern Pennsylvania, No. 1	37.00 to 38.00
Cleveland, No. 1	31.00 to 32.00
St. Louis, No. 1	28.00 to 28.50
St. Louis, No. 2	27.00 to 27.50
Buffalo	28.00 to 29.00
Cincinnati	28.00 to 29.00
Birmingham, No. 1	23.00 to 25.00
New York, No. 1 (dealers)	32.00 to 32.50
Boston (dealers)	30.00 to 31.00

WROUGHT PIPE

Eastern Pennsylvania	$25.50 to 26.00
Buffalo	19.00 to 20.00
New York (dealers)	21.50 to 22.00
Boston (dealers)	19.00 to 20.00

YARD WROUGHT

Eastern Pennsylvania, No. 1	$30.00 to 31.00

CITY WROUGHT

New York, long (dealers)	24.50 to 25.50

BUSHELING

Chicago, No. 1	$22.75 to 23.25
Chicago, No. 2	15.50 to 16.00
Cleveland, No. 1	22.00 to 22.50
Cleveland, No. 2	19.00 to 21.00
St. Louis, No. 1	24.00 to 24.50
Buffalo, No. 1	22.00 to 23.00
Cincinnati, No. 1	20.50 to 21.50
Eastern Pennsylvania, No. 1	24.00 to 25.00

MACHINE SHOP TURNINGS

Pittsburgh	$18.50 to 19.00
Chicago	14.50 to 15.00
Eastern Pennsylvania	21.00 to 22.00
Eastern Pennsylvania (Blast furn.)	19.00 to 20.00
Cleveland	15.00 to 15.00
Buffalo	17.50 to 18.00
New York (dealers)	17.50 to 18.00
St. Louis	16.00 to 16.50
Cincinnati	14.00 to 14.50
Birmingham	16.00 to 17.00
Valleys	17.50 to 18.00
Boston (dealers)	17.00 to 17.25
Boston (blast furnace) (dealers)	15.00 to 15.50
Detroit	14.00 to 14.50

CAST IRON BORINGS

Pittsburgh	$20.50 to 21.00
Chicago	15.00 to 15.50
Eastern Pennsylvania	23.00 to 24.00
Eastern Pennsylvania (chemical)	28.00 to 30.00
Cleveland	18.00 to 18.50
St. Louis	16.00 to 16.50
Buffalo	20.00 to 21.00
New York (dealers' price)	19.00 to 20.00
Cincinnati	15.00 to 16.00
Birmingham	13.00 to 15.00
Valleys	19.75 to 20.00
Boston (dealers)	19.50 to 20.50
Boston (blast furnace) (dealers)	14.00 to 14.50
Detroit	16.50 to 17.00

IRON AXLES

Pittsburgh	$46.00 to 47.00
New York (dealers)	46.00 to 47.00
Chicago	44.50 to 45.00
Eastern Pennsylvania	45.00 to 46.00
Cleveland	42.50 to 43.00
St. Louis	41.00 to 41.50
Buffalo	40.00
Cincinnati	36.00 to 37.00
Birmingham	31.00 to 34.00

IRON RAILS

Chicago	32.50 to 33.00
Cleveland	30.00 to 31.00
St. Louis	33.50 to 34.00
Buffalo	28.00 to 29.00
Cincinnati	26.00 to 27.00

PIPES AND FLUES

Chicago	19.00 to 19.50
Cleveland	25.00 to 26.00
St. Louis	22.50 to 23.00
Cincinnati	21.00 to 21.50

GRATE BARS

Chicago	34.00 to 34.50
Cleveland	30.00 to 31.00
Buffalo	24.00 to 25.00
New York	26.00 to 27.00
Eastern Pennsylvania	32.00 to 33.00
Detroit	21.00 to 22.00

FORGE FLASHINGS

Cleveland, large	$19.00 to 19.50
Chicago, small	18.50 to 19.00
Cleveland, small	21.00 to 21.50
Boston (dealers)	15.00 to 16.00

FORGE SCRAP

Chicago	26.50 to 27.00
Eastern Pennsylvania, No. 1	21.00 to 22.00
Boston	14.50 to 15.00

ARCH BARS AND TRANSOMS

Chicago	34.50 to 35.00
St. Louis	36.00 to 36.50

ANGLE BARS—IRON

Chicago	35.00 to 35.50
St. Louis	33.00 to 33.50

Iron and Steel Works Scrap

AXLE TURNINGS

Pittsburgh	$22.00 to 23.00
Eastern Pennsylvania	22.00 to 23.00
Boston (dealers)	17.50 to 18.00
St. Louis	17.00 to 17.50
Cleveland	22.50 to 23.00
Buffalo	21.00 to 22.00
Chicago	19.50 to 20.00

STEEL CAR AXLES

Pittsburgh	$36.00 to 37.00
Eastern Pennsylvania	35.00 to 36.00
Cleveland	37.50 to 38.50
St. Louis	37.00 to 37.50
Buffalo	40.00
Chicago	39.50 to 40.00
New York (dealers)	37.00 to 38.00
Birmingham	33.00 to 34.00
Boston (dealers)	29.00 to 30.00
Detroit	32.00 to 33.00

SHAFTING

Eastern Pennsylvania	36.00 to 38.00
St. Louis	35.50 to 36.00
New York (dealers)	31.00 to 32.00
Chicago	35.50 to 36.00

Iron Foundry Scrap

CAR WHEELS

Pittsburgh, iron	$41.00 to 42.00
Pittsburgh, steel	29.00 to 30.00
Chicago, iron	35.50 to 36.00
Eastern Pennsylvania, iron	42.50 to 45.00
Cleveland, iron	36.00 to 37.00
St. Louis, iron	33.50 to 34.00
Buffalo, iron	37.00 to 38.00
Birmingham, iron	29.00 to 31.00
Birmingham, tram car	29.00 to 30.00
Boston	38.00 to 39.00
Cincinnati	30.00 to 31.00
Detroit	31.00 to 31.50
New York, iron	36.00 to 37.00

NO. 1 CAST SCRAP

Pittsburgh, cupola	$41.00 to 42.00
Chicago, cupola	42.00 to 42.50
Eastern Pennsylvania, cupola	40.00 to 41.00
Cleveland, cupola	39.00 to 40.00
New York, cupola (dealers)	38.50 to 39.50
Cincinnati, No. 1, machinery, cupola (net)	34.00 to 35.00
Birmingham, cupola	31.00 to 33.00
St. Louis, railroad	39.00 to 39.50
St. Louis, agricultural	38.50 to 39.00
Buffalo	37.00 to 38.00
Boston	41.00 to 42.00
Valleys	38.00 to 39.00
Detroit	34.00 to 34.50

HEAVY CAST

New York (dealers)	35.50 to 36.50
Buffalo	27.00 to 28.00
Pittsburgh	35.00 to 36.00
Cleveland	30.00 to 30.50
Boston	33.00 to 34.00

MALLEABLE

Pittsburgh, railroad	$33.00 to 34.00
Pittsburgh, agricultural	32.00 to 33.00
Chicago, railroad	33.50 to 34.00
Chicago, agricultural	33.50 to 34.00
Eastern Pennsylvania, railroad	29.00 to 30.00
Cleveland, railroad	31.50 to 32.00
Cleveland, agricultural	27.00 to 28.00
St. Louis, railroad	29.00 to 29.50
St. Louis, agricultural	28.00 to 28.50
Cincinnati, railroad	28.00 to 28.50
Cincinnati, agricultural	28.00 to 28.50
Boston, railroad	28.00 to 29.00
Buffalo	31.00 to 32.00

Miscellaneous Scrap

REROLLING RAILS

5 feet and over

Pittsburgh district	$36.00 to 37.00
Chicago	32.50 to 33.00
Eastern Pennsylvania	35.00 to 36.00
Cleveland	34.00 to 35.00
St. Louis	32.00 to 32.50
Birmingham	31.00 to 32.00
Boston (dealers)	30.00 to 30.50

LOCOMOTIVE TIRES

Chicago	29.00 to 30.00
St. Louis	39.00 to 39.50

BOILER PUNCHINGS

Chicago	30.00 to 30.50
Eastern Pennsylvania	30.00 to 32.00

A Request

Kindly send us your inquiries on the Iron and Steel Scrap you have for sale or wish to buy. We will name you good prices, and if awarded any of your business, will endeavor to please you as we want your friendship as well as to do business with you.

Sue us
Concerning Your
Requirements
And our
Prices

MILLCO
SERVICE

Sell
Carloads
Right
And be
Pleased

The James D. Miller Company
McCormick Bldg Chicago.

New Trade Publications

TOOL GRINDING.—The Gisholt Machine Co., Madison, Wis., is circulating a 4-page leaflet in which a number of grinding operations are shown. One illustration shows small tool bits being ground, while the others show the grinding of bent tools and flat tools.

INDUSTRIAL RELATIONS.—The Norton Co., Worcester, Mass., has published a booklet contining a number of reprints of papers, prepared by heads of the company's various departments, which briefly outline the service, employment, medical, safety, recreation, co-operative gardening and housing activities of the company for its employes.

CRUCIBLES.—The importance of keeping and handling crucibles in a manner which will insure the greatest number of heats with the least danger of accidents, is emphasized in a booklet entitled. "Crucibles—Their Care apd Use," which was recently published by the Joseph Dixon Crucible Co., Jersey City, N. J.

FIREPROOF EQUIPMENT.—The Mfg. Equipment & Engineering Co., Boston, has published a number of booklets, in which sanitary and fireproof equipment for factories, foundries, public buildings, etc., is described and illustrated. The equipment includes, wash bowls, metal lockers, plumbing fixtures, metal furniture, metal racks, sanitary drinking fountains and miscellaneous metal equipment.

FIREBRICK CEMENT.—The McPhee Cement Co., Scranton, Pa., has published a 4-page leaflet in which cement for bonding firebrick and for kindred uses is described. According to the leaflet this cement is air and gas tight and has the same coefficient of expansion and contraction as firebrick. The leaflet further states that this cement sets at normal temperature and holds its strength up to 3000 degrees Fahr. Other details are given.

STEEL PRODUCTS.—A 48-page catalog listing and describing high-speed, carbon and alloy steels, drill rods, forges, drill steel, billets, bars, etc., has been published by the Duke Steel Co., Inc., 191 Pearl St., New York City. In addition to describing the products of the Duke Steel Co. and its associated works, The Dukeshire Steel & Forge Co., the catalog contains useful tables of weights and classification of extras on all steels.

POWER HAMMERS.—Beaudry & Co., Inc., Boston, have published a 16-page illustrated booklet in which power hammers, either belt or motor driven, are described and illustrated. These hammers are built in sizes ranging from 50 to 500 pounds weight of ram. They are designed for light and heavy railroad, machine and general blacksmithing; for swaging, collaring, drawing and general manufacturing, and according to the booklet, they will handle varying thicknesses of stock without change of adjustment. Both types are described in detail.

WELDING EQUIPMENT.—Welding and cutting torches, regulators, preheating outfits, etc., are described and illustrated in a booklet recently published by the Messer Welding Supply Corp., Brooklyn, N. Y. The welding torch is of the injector type and works on the low pressure or vacuum principle. It has seven interchangeable heads with hard copper heads and necks. The cutting torch also operates on the injector principle, and the torch head is so constructed that the preheating flame entirely surrounds the concentrated cutting jet. Besides describing the equipment, the booklet contains instructions for setting up and using welding outfits.

OPTICAL PYROMETERS.—Catalog No. 86-B describing and explaining the use of optical pyrometers recently was issued by the Leeds & Northrup Co., 4922 Stenton avenue, Philadelphia. The booklet gives an account of the physical principles involved and states that the instrument is adapted for measuring temperatures too high and too inaccessible to be measured by thermocouples, temperatures that vary rapidly, temperatures of objects which do not reach furnace temperatures, temperatures of moving objects, etc. The pyrometer is used in gaging temperatures in muffle furnaces, electric furnaces, in the open, in fuel beds, heat-treating furnaces, the rolling and forging of steel, blast furnaces, of molten steel and slag, molten cast iron, molten nonferrous metals, molten glass, in ceramic furnaces, etc., and for checking thermocouple pyrometers.

BALLAST CLEANER.—The Link-Belt Co., Chicago, has published a 4-page leaflet, in which a machine which mechanically screens dirt from the stone ballast between railroad tracks, is described and illustrated. The machine consists of a bucket elevator, a shaking wire mesh screen, a gasoline engine with driving mechanism, mounted on a wide steel frame. The machine moves forward on an endless chain propelled by a rachet mechanism operated by the same engine which furnishes power to the digging elevator. It also can be moved by a hand lever. According to the leaflet, as the machine is moved along the space between the tracks, the shovel digs up the ballast to a depth of 14 inches below the top of the ties, depositing it in the hopper of the shaking screen, which sifts the dirt from the stone ballast. Other details are given.

COMBUSTION CONTROL.—A booklet is being circulated by the Carrick Engineering Co., Chicago, containing data on combustion control. The apparatus described consists of a mercury reservoir with a steam connection to the top. A vertical mercury cylinder and free-moving plunger with a pipe connection from the cylinder base to the bottom of the mercury reservoir. A floating valve gear with one side direct connected to the plunger, mounted as a part of a hydraulic set. A hydraulic cylinder, the piston of which is direct connected to the other side of the floating valve gear and a 4-way hydraulic valve operated by the floating valve gear which is connected with the water lines to the top and bottom of the hydraulic cylinder. Full data pertaining to the apparatus, and a description of its operation, etc., are given, as well as a number of illustrations, which include recording charts showing results.

Opportunities Abroad

Requests for information should be forwarded to district or co-operative office in your district, of the Bureau of Foreign and Domestic Commerce. Each request should be on a separate sheet and be accompanied by the opportunity number

DISTRICT OFFICES

New York, 734 Customhouse; Boston, 1801 Customhouse; Chicago, 504 Federal bldg.; St. Louis, 402 Third Nat'l Bank; New Orleans, Hibernia Bank; Seattle, Henry bldg.; San Francisco, 307 Customhouse

CO-OPERATIVE OFFICES

Cleveland, Chamber of Commerce; Cincinnati, Chamber of Commerce; Los Angeles, Chamber of Commerce; Philadelphia, Chamber of Commerce; Portland, Oreg., Chamber of Commerce; Dayton, Ohio, Chamber of Commerce; Pittsburgh, Chamber of Commerce

Manufacturers in Peru desire to receive catalogs of shoe machinery lasts. Opportunity No. 32080.

A former president of the Victorian Institute of Electric Engineers in Australia is anxious to make early connections with an American manufacturer who is able to participate in bidding on tenders soon to be called for by the Victorian government, covering equipment for a high tension project, involving three turbo-generators of 25,000 kilowatts, capacity for 130,000 volt, 50 cycle transmission, and the appliances and accessories required with such an installation. Opportunity No. 32083.

A city in Canada is in the market for $200,000 worth of rolling stock to be placed on the city car lines. Opportunity No. 32093.

One of the large printing plants in Czechoslovakia wishes to purchase presses for the printing of bank notes, etc., equipment for making the necessary plates, printing and embossing presses, and complete engraving equipment, etc. Catalogs and prices are requested. Opportunity No. 32094.

A commercial agent in France desires to represent firms in France and Colonies, and in the principal cities of Europe for the sale of various lines, including machine tools, etc. Opportunity No. 32095.

An agency is desired by a man in New Zealand for the sale of wire nails, nail wire, galvanized, plain and barbed wire, plain and galvanized corrugated iron, malleable pipe fittings, galvanized and black pipe and galvanized slice cut staples. Opportunity No. 32096.

A manufacturer in Czechoslovakia wishes to secure machines and equipment for iron and steel works, and requests illustrated catalogs and price lists. Opportunity No. 32102.

A provincial government in Canada is to expend about $500,000 during the next two years for road-making machinery, motor trucks, trailers, etc. Opportunity No. 32103.

The purchase is desired by a party in Egypt of two or three steel or wood motor vessels of about 200 tons each. Opportunity No. 32106.

A commercial agent in France desires to purchase and secure an agency for modern lighting and heating apparatus. Opportunity No. 32108.

A plantation owner in Guatemala desires to purchase several small tractors and trailers. Opportunity No. 32110.

A firm in the Netherlands holding controlling interests in sugar and rubber plantations desires to purchase and secure an agency for machinery and tools for Dutch East Indian sugar factories and rubber plantations. Opportunity No. 32111.

A consulting engineer for a packing plant in France desires to purchase canning machinery, and equipment for a packing plant. Opportunity No. 32116.

A commission agency company in Switzerland desires to represent exporters for the sale of raw materials, produce, and products of all kinds, including metals, chemicals, etc. Opportunity No. 32123.

A firm in Spain desires to secure agencies for the sale of machinery and accessories and electrical materials. Correspondence should be in Spanish or French. Opportunity No. 32127.

An agency is desired by a merchant in Algeria for the sale of agricultural machinery, tractors, and chemical products. Correspondence should be in French or Spanish. Opportunity No. 32135.

The Clark Tructractor pulls loaded trailers and turns sharp corners in narrow places

SPEED PRODUCTION

With This Gasoline Truck and Tractor

THE Clark Tructractor helps to stop production losses due to delayed inter-departmental delivery.

Gasoline-driven, the Tructractor is ready for work 24 hours a day. It never needs a rest.

The Tructractor carries 2500 pounds of wet or dry, hot or cold materials and hauls heavily-loaded trailers at the same time. Load in front permits direct delivery into bins or machines.

It is only 42 inches wide and so passes through narrow, crowded aisles, right up to desired unloading point.

Clark Tructractors are speeding production in many industries by solving transportation problems.

An illustrated booklet showing how, will be sent on request.

CLARK TRUCTRACTOR CO.
1134 Michigan Ave. CHICAGO

CLARK TRUCTRACTOR Co. CHICAGO U.S.A.

CLARK TRUCTRACTOR

THE Gasoline Industrial Truck

Iron and Steel Prices

Iron Ore

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 per cent iron.....$7.45
Mesabi Bessemer, 55 per cent iron..... 7.20
Old range nonbessemer, 51½ per cent iron.. 6.70
Mesabi nonbessemer, 51½ per cent iron.... 6.55

Manganese Ore

Brazilian, 45 to 50 per cent, c.i.f. Atlantic ports, 75c to 80c per unit.

Indian, 45 to 50 per cent, c.i.f. Atlantic ports, 75c to 80c per unit, nominal.

Warehouse Prices

Steel bars, Boston	4.50c
Steel bars, Chicago	3.37c to 3.87c
Steel bars, Cleveland	3.37c to 4.00c
Steel bars, Detroit	4.085c
Steel bars, Philadelphia	4.25c
Steel bars, New York	3.37c to 4.50c
Steel bars, St. Louis	3.94c
Steel bars, Cincinnati	4.50c
Steel bars, St. Paul	3.595c
Steel bars, Buffalo	4.06c to 4.11c
Iron bars, Boston	4.50c
Iron bars, Buffalo	4.76c
Iron bars, Chicago	3.37c to 3.87c
Iron bars, Detroit	4.085c
Iron bars, St. Louis	4.09c
Iron bars, Cincinnati	4.50c
Iron bars, Philadelphia	4.25c
Iron bars, New York	4.25c to 4.50c
Shapes, Chicago	3.47c to 3.97c
Shapes, Detroit	3.935c
Shapes, Boston	4.25c
Shapes, St. Louis	4.04c
Shapes, St. Paul	3.695c
Shapes, New York	3.47c to 4.25c
Shapes, Cleveland	3.37c to 4.10c
Shapes, Philadelphia	4.25c
Shapes, Buffalo	3.91c to 3.96c
Shapes, Cincinnati	3.65c
Plates, Buffalo	4.60c
Plates, Chicago	3.67c to 4.17c
Plates, Detroit	4.135c
Plates, Boston	4.80c
Plates, St. Louis	4.24c
Plates, St. Paul	3.895c
Plates, New York	3.67c to 4.25c
Plates, Cleveland	3.57c to 4.50c
Plates, Philadelphia	5.00c
Plates, Cincinnati	5.25c
No. 10 blue anl. sheets, N. Y.	5.57c to 6.50c
No. 10 blue anl. sheets, Phila.	6.50c to 7.00c
No. 10 blue anl. sheets, Chicago	4.57c to 4.82c
No. 10 blue anl. sheets, Cleveland	5.85c
No. 10 blue anl. sheets, Boston	6.05c
No. 10 blue anl. sheets, Buffalo	5.46c to 5.51c
No. 10 blue anl. sheets, St. L.	5.59c
No. 10 blue anl. sheets, Cincinnati	6.00c
No. 10 blue anl. sheets, St. Paul	4.79c
No. 10 blue anl. sheets, Detroit	5.485c
No. 28 black sheets, Chicago	5.62c to 6.00c
No. 28 black sheets, New York	7.00c to 8.00c
No. 28 black sheets, Phila.	7.00c to 7.50c
No. 28 black sheets, Cleveland	6.65c
No. 28 black sheets, Boston	8.15c
No. 28 galv. sheets, Cincinnati	8.50c
No. 28 black sheets, Detroit	6.75c
No. 28 black sheets, St. Louis	7.10c
No. 28 black sheets, St. Paul	5.845c
No. 28 black sheets, Buffalo	7.50c
No. 28 galv. sheets, Chicago	6.97c to 7.50c
No. 28 galv. sheets, New York	8.25c to 10.00c
No. 28 galv. sheets, Phila.	9.00c to 9.50c
No. 28 galv. sheets, Boston	9.50c
No. 28 galv. sheets, Cleveland	8.00c
No. 28 galv. sheets, Cincinnati	8.50c
No. 28 galv. sheets, Detroit	8.25c
No. 28 galv. sheets, Buffalo	8.50c
No. 28 galv. sheets, St. Louis	8.10c
Bands, New York	4.12c to 4.50c
Bands, Boston	6.00c
Bands, Detroit	4.785c
Bands, Buffalo	4.76c to 5.16c
Hoops, Buffalo	5.96c
Hoops, Boston	7.00c
Hoops, New York	5.07c to 5.50c
Hoops, Detroit	5.025c
Cold rolled shafting, Buffalo	5.50c to 6.00c
Cold rolled shafting, New York	5.50c to 6.25c
Cold rolled shafting, Boston	6.00c
Cold rolled flats, squares and hexagons, New York	6.00c to 6.75c
Cold rolled rounds	5.50c

Mill Sheet Schedule

BLACK

Differentials for gage, per 100 pounds

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches wide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long. Extras for width and length to be added.

GALVANIZED AND LONG TERNE

Differentials for gage, per 100 pounds.

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	—15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 13-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inc., 24, 26, 28, 30 and 36 in. wide by 72, 84, 96 and 120 in. long. Extras for width and length to be added.

Freight Rates

PIG IRON

Mahoning and Shenango valleys to:

Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70

Buffalo to:

Albany, N. Y.	$1.80
New England (rail)	3.90
New York and Brooklyn (rail)	3.90

Virginia furnaces to:

Philadelphia	4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40

Birmingham, Ala., to:

Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
St. Louis	$4.30

Chicago to:

Des Moines	3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90

Ironton and Jackson, O., to:

Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

FINISHED MATERIAL

Pittsburgh, carloads, per 100 lbs., to:

New York	27.0 cents
Philadelphia	25.0 cents
Boston	30.0 cents
Buffalo	21.0 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

BLUE ANNEALED

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	+ 5c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

STEEL PIPE

Pittsburgh basing discounts to jobbers in carloads

STANDARD WEIGHT

Butt Weld	Black	Galvanized
⅛, ¼ and ⅜-inch.	47 to 50½	20½ to 24
½-inch	51 to 54½	36½ to 40
¾ to 3-inch	54 to 57½	40½ to 44
Lap Weld		
2-inch	47 to 50½	34½ to 38
2½ to 6-inch	50 to 53½	37½ to 41
7 to 12-inch	47 to 50½	33½ to 37
13 to 14-inch	37½ to 41	
15-inch	35 to 38½	

PLUGGED AND REAMED

Butt Weld		
1 to 3-inch	52 to 55½	38½ to 42
2-inch	45 to 48½	32½ to 36
Lap Weld		
2½ to 6-inch	48 to 51½	35½ to 39

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛, ¼ and ⅜-inch.	43 to 46½	25½ to 29
½-inch	48 to 51½	35½ to 39
¾ to 1½-inch	52 to 55½	39½ to 43
2 to 3-inch	53 to 56½	40½ to 44
Lap Weld		
2-inch	45 to 48½	33½ to 37
2½ to 4-inch	48 to 51½	36½ to 40
4½ to 6-inch	47 to 50½	35½ to 39
7 to 8-inch	43 to 46½	29½ to 33
9 to 12-inch	38 to 41½	24½ to 28

DOUBLE EXTRA STRONG PLAIN

Butt Weld		
½-inch	39 to 42½	28½ to 32
¾ to 1½-inch	42 to 45½	31½ to 35
2 to 2½-inch	44 to 47½	33½ to 37
Lap Weld		
2-inch	37 to 40½	27½ to 31
2½ to 4-inch	39 to 42½	29½ to 33
4½ to 6-inch	38 to 41½	28½ to 32
7 to 8-inch	33 to 36½	19½ to 23

WROUGHT IRON PIPE

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

Butt Weld	Black	Galv.
⅛-inch	1	+14
¼-inch	24½	+ 2½
⅜-inch	25½	+ 1½
½-inch	29½	11½
¾ to 1½-inch	34½	18½
Lap Weld		
2-inch	28½	14½
2½ to 6-inch	30½	17½
7 to 12-inch	27½	14½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld		
⅛, ¼-inch	+21	+36
⅜-inch	28½	6½
½-inch	28½	15½
¾ to 1½-inch	34½	19½
Lap Weld		
2-inch	29½	16½
2½ to 4-inch	31½	19½
4½ to 6-inch	30½	18½
7 and 8-inch	22½	10½
9 and 12-inch	17½	5½

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld	Black	Galv.
½-inch	15½	3½
¾ to 1½-inch	20½	8½
Lap Weld		
2-inch	16½	4½
2½ to 4-inch	18½	9½

Lapweld Boiler Tubes

Discounts off manufacturers' standard list, in carloads; less carloads, 4 points less.

STEEL

1¾ and 2-inch	12½ to 19½
2¼-inch	17 to 24
2½ to 3¼-inch	23 to 30½
3½ to 4½-inch	30½ to 40½

IRON

1¾-inch	+20
2 and 2¼-inch	+10
2½ and 2¾-inch	+ 1
3 and 3½-inch	— 1½
3½ to 4½-inch	—11